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Scientific, Technical and Economic Committee for Fisheries (STECF)

Economic Performance of the EU Aquaculture Sector (STECF-OWP-12- 03)

Edited by Jordi Guillen, Franca Contini & Hendrik Doerner

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European Commission
Joint Research Centre
Institute for the Protection and Security of the Citizen

Contact information
Address: TP 051, 21027 Ispra (VA), Italy
E-mail: stecf-secretariat@jrc.ec.europa.eu
Tel.: 0039 0332 789343
Fax: 0039 0332 789658

https://stecf.jrc.ec.europa.eu/home
http://ipsc.jrc.ec.europa.eu/
http://www.jrc.ec.europa.eu/

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COMMITTEE FOR FISHERIES (STECF) BY WRITTEN PROCEDURE

Economic Performance of the EU Aquaculture sector (STECF-OWP-12-03)

MARCH 2012

Request to the STECF

STECF is requested to review the report of the **EWG-11-14** expert working group meeting, evaluate its findings and make any appropriate comments and recommendations. The meeting took place in the period October 3 – 7, 2011, in Ispra, Italy.

STECF observations

STECF notes, that the report of the STECF EWG-11-14 on the Economic performance of the aquaculture sector represents the first attempt to analyze the economic data for aquaculture, collected under the DCF. The Working Group addressed all Terms of Reference and its report is a comprehensive summary of the information available to date.

STECF also notes that EUROSTAT recently commenced collection of additional data for aquaculture (Reg. No 762/2008 of 9 July 2008 on the submission by Member States of statistics on aquaculture), e.g. value of production (by specie), structure of the sector (capacity), input to capture-based aquaculture (volume and value). Data collection for the aquaculture sector is segmented according to fish species and production technique in both in the DCF and by EUROSTAT. However the groupings of the data are different.

According to the recent reports on EU aquaculture, the sector is suffering from a period of stagnation (low production growth). However, the EU aquaculture sector has the potential for future growth, through its capacity for innovation and technological development. However, there is a clear need for improved and more coherent governance and management to facilitate the development of responsible and sustainable aquaculture in the EU. Specifically, there is scope to reduce the delay in the licensing process and to reduce the complexity of implementing and applying the EU legislation at the national level.

STECF conclusions

STECF concludes that the information in the report of the EWG 11-14 has exceeded expectations. The economic data analysed represents more than 80% of the production of the whole EU aquaculture sector. The main reasons for not achieving 100% coverage, as compared to EUROSTAT are that DCF data collection has not been applied to EU landlocked countries, freshwater aquaculture is not compulsory in the DCF, and Italian data coverage is poor.. Some countries provided data, which is not obligatory under the DCF, e.g. data for fresh water aquaculture. However, Greece, France and UK, which collectively account for about 50% of the production value of the EU aquaculture, did not

provide a complete set of economic indicators required for the analysis, thus making calculation of most economic indicators for these Member States impossible.

STECF concludes, even though the data collected by EUROSTAT and through the DCF serve two different purposes, it is likely to be advantageous to improve the homogeneity of data coming from both sources. In particular, the possibility to combine data coming from different sources in this first phase of implementation both for the DCF and for the new regulation on aquaculture statistics (Reg. No 762/2008 of 9 July 2008 on the submission by Member States of statistics on aquaculture), would permit validation of the data, provide a more comprehensive picture of aquaculture development in the EU, and would also reduce the workload in the national administrations in charge of data collection.

STECF concludes, that compared to EUROSTAT, more indicators are collected under the DCF thereby allowing a more detailed economic performance analysis of aquaculture. However, data on volume of production and data at the site level (capacity), required by EUROSTAT are not requested under the DCF. Due to different aggregation level these sets of data, are not compatible at present but could be harmonized in the future to complement each other.

STECF recommendations

To facilitate a more comprehensive evaluation of the economic performance of the EU aquaculture sector, STECF recommends that Greece, France, Italy and UK ensure the submission of all requested data under future data calls. STECF also reminds all Member States that there is an obligation to respect the deadline for data submission as specified in the DCF Regulation.

REPORT TO THE STECF

EXPERT WORKING GROUP ON THE ECONOMIC PERFORMANCE OF THE EU AQUACULTURE SECTOR (EWG-11-14)

Ispra, 3 -7 October 2011

This report does not necessarily reflect the view of the STECF and the European Commission and in no way anticipates the Commission's future policy in this area

1. EXECUTIVE SUMMARY

The 2011 Economic Report on the Economic Performance of the EU Aquaculture sector provides a comprehensive overview of the latest information available on the structure, social, economic and competitive performance of the aquaculture sector at national and EU level.

This report was produced by the EWG 11-14 of the STECF. This is the first report of this type produced for the aquaculture sector. The data used in this publication relates to 2008 and 2009, and was collected under the Data Collection Framework (DCF). In fact, this is the first time that DCF aquaculture data has been requested for EU countries. Data for about the 80 % of the total EU aquaculture has been submitted; but some Member States did not provide all the necessary data to estimate all the economic performance indicators. The main reasons for not accounting for all production is that on the DCF the collection of freshwater aquaculture data is not compulsory, and that the Italian data is clearly underestimated. Data submitted has been reviewed by the JRC and the national experts that participated in the elaboration of this report. Still, some of the data generates some concerns; consequently these data concerns have been highlighted in the report. Therefore, some results should be considered with caution. We would like to remind that Member States are the responsible for the quality and completeness of the data (Council Regulation (EC) No 199/2008).

The report includes an EU overview chapter, a special topic chapter and national chapters. The *Introduction* presents a number of different international sources of information on aquaculture that can help to complement economic aquaculture data collected under the framework of the DCF. The two main alternative international sources for EU data on aquaculture are EUROSTAT and FAO.

Under the DCF data collection program, additional parameters are collected and reported to allow for more detailed economic performance analysis. However, please note that data on production as well as data at the site level are not requested under the DCF framework. Other data sources, such as EUROSTAT and FAO, report production data at a higher level of segment disaggregation. But further segment disaggregation for economic data collected under the DCF could raise issues of confidentiality, since economic data cannot be made public for segments that do not feature a large enough number of companies.

Though the data collected separately though EUROSTAT and through the DCF serve different purposes, there could be advantages in being able to compare data from these two data sources. This is especially the case in this initial phase of implementation of data collection both for the DCF and for the new regulation on aquaculture statistics. The possibility to link data coming from different sources would help to validate the data and obtain a more accurate and comprehensive picture of aquaculture development in the EU.

In the *EU aquaculture sector overview*, the EU aquaculture sector is situated in the global context. World aquaculture production is led by Asia with 91 % of the production in quantity terms and 80 % in value terms, with China standing for 62 % in quantity and 52 % in value of the world production, followed by Indonesia, India and Vietnam. Norway is the only European country situated in the top 10 aquaculture countries, the 10th in volume and the 7th in value (FAO). In strong contrast, the EU-27 is only a minor player in aquaculture production, in both volume and value terms, representing 2 % and 4 % of global output, respectively.

In 2009, the aquaculture sector production in the EU-22 (excluding the 5 landlocked Member States) accounted for 1.30 million tones, with a turnover estimated at 3.33 billion Euros. Results suggest that the EU accounts for 14-15,000 companies whose main activity is aquaculture production, having produced a Gross Value Added of almost 270 million Euro in 2009. It has been possible to estimate the profitability (based on the Earnings Before Interest & Tax and the Return On Investment) for 16 countries; 12 of them had profits (a positive EBIT) and only 4 had losses (negative EBIT). However, the overall profitability has been negative and in 2009 the ROI stood at -1.6 %. These overall negative results are driven by the losses on the Spanish and Maltese aquaculture sectors. It also must be noted that the economic performance and the productivity differed enormously across segments. The cost structures of the different segments are presented in detail in the national chapters.

The EU aquaculture sector gave direct employment to around 80,000 people in Europe, with an annual average wage of around 13,750 Euro. The large percentage of part-time work in the sector should be highlighted, as can be seen through comparison of the total employment numbers with employment expressed in Full Time Equivalents (FTE is 38 % of the total number of employees). Women accounted for the 25 % of the jobs in the sector.

The *topic of special interest focuses on the "Successful cases of EU aquaculture development"*. In fact, while the EU aquaculture sector has achieved a lot over the last decades, the sector is currently

suffering from a period of stagnation (low production growth). However, if some of the main obstacles could be removed, the EU aquaculture sector with its strong capacity in innovation and technological development could overcome its stagnation.

The slow development of EU-Aquaculture is not due to a bad market situation or to unfavourable natural conditions. The main reason has been the difficulty to integrate environmental policy with a viable aquaculture economy, due to concerns related to the environmental impact of aquaculture. Consequently, the economic performance of the industry has weakened. There is a clear need for a better and more coherent governance and management to facilitate the development of responsible and sustainable aquaculture in the EU. Solutions may include reducing delays in the licensing process or reducing the complexity of transposition and application of EU legislation.

National chapters for the 22 non-landlocked EU Members States are provided. For those countries where DCF data was not submitted (Belgium, Latvia and Lithuania), the national chapters were completed using other data sources, such as from EUROSTAT and FAO. The reason for which these Member States did not submit data is that they only have freshwater aquaculture and, under the DCF aquaculture data call, the collection of data on fresh water species is not mandatory.

The report includes also a *Glossary* with definitions for all the variables collected as well as the indicators used in the analysis (together with their formulas).

Finally, *Tables* with all data used in the analysis and the main indicators are reported in the Appendices (section 12).

2. CONCLUSIONS OF THE WORKING GROUP

The economic data analysed in this report represents more than the 80 % of the production of the whole EU aquaculture sector, which is a rather good coverage result compared to similar reports. The reasons for not accounting for all production is that on the DCF the collection of freshwater aquaculture data is not compulsory, and that the Italian data is clearly underestimated. Moreover, some Member States did not provide all the necessary data to estimate all the economic performance indicators, or the data submitted raises some concerns. This is normal considering that this is the first time the DCF aquaculture data has been requested and the analysis of the sector has been done under the STECF. Therefore, some results should be considered with caution.

EU (27) is a minor player in the world's aquaculture production, in both volume and value terms, representing 2 % and 4 % of global production, respectively. Aquaculture production worldwide is led by Asia with 91 % of the production in quantity terms and 80 % in value terms, with China standing for 62 % in quantity and 52 % in value of world production, followed by Indonesia, India and Vietnam. Norway is the only European country among the top-10 aquaculture countries, the 10th in volume and the 7th in value (FAO).

In 2009, the aquaculture sector production in the EU-22 (excluding the 5 landlocked Member States) accounted for 1.30 million tones, with a turnover estimated at 3.33 billion Euros. The EU has around 14-15,000 companies whose main activity is aquaculture production that accounted for a Gross Value Added of almost 270 million Euros in 2009. Profitability (based on the Return On Investment calculated from the EBIT) for 2009 is negative (the sector has been suffering losses) at -1.6 %. This overall negative results are driven by the important losses of the Spanish and Maltese aquaculture sectors. However, for the 16 countries that is has been possible to estimate the EBIT, 12 of them had profits (a positive EBIT) and only 4 had losses (negative EBIT). The economic performance and the productivity, differ enormously across segments. The cost structures of the different segments are also presented in detail in the national chapters.

The EU aquaculture sector gave direct job to around 80 thousand people in the whole of Europe, with an annual average wage of around 13.75 thousand Euros. The large percentage of part-time work in the sector should be noted, as can be seen when comparing the total employment with the employment in

Full Time Equivalents (the employment in FTE terms is equivalent to 38 % of the total number of employees). Women accounted for the 25 % of the jobs in the sector.

In fact, the EU aquaculture sector has obtained several achievements in the last decades, but the sector is currently suffering from a period of stagnation (low production growth). If some of the main obstacles are removed, the EU aquaculture sector should be able to overcome the current situation, especially through its capacities in innovation and technological development. The sluggish development of EU-aquaculture is not due to a bad market situation or to unfavourable natural conditions. The main reason has been the difficulty to integrate environmental policy with a viable aquaculture economy, due to concerns related to the environmental impact of aquaculture. Consequently, the economic performance of the industry has weakened. There is a clear need for a better and more coherent governance and management to facilitate the development of responsible and sustainable aquaculture in the EU. Solutions may involve reducing delays in the licensing process as well as reducing the complexity of transposing and applying the EU legislation.

Although the data collected by EUROSTAT and through the DCF serve different purposes there could be several advantages in coordinating better data collection across these two data sources. Especially in this first phase of implementation both for the DCF and for the new regulation on aquaculture statistics, the possibility to link data coming from different sources would help to validate the data and get a more comprehensive and accurate picture of aquaculture development in the EU. It would also help avoid duplication of effort by national administrations in charge of collecting the data. Under the DCF data collection program a number of additional parameters are collected and reported, allowing for a more detailed economic performance analysis. However, data on production and data at the site level are not requested under the DCF. Data sources such as EUROSTAT and FAO report data at a higher level of segment disaggregation. But further segment disaggregation also for the economic data collected under the DCF would increase the confidentiality risk, since economic data cannot be made public for the segments that do not have a large enough number of companies.

Finally, we expected that coverage and quality in the next data calls on the EU aquaculture sector should improve.

3. RECOMMENDATIONS OF THE WORKING GROUP

The EWG recommends that actions need to be taken to improve the data coverage, in the sense that some Member States did not submit all the data that they were requested to submit. Major omissions for parameters were found for Greece, France and the United Kingdom.

The EWG recommends that actions be taken to avoid delays from non-respect of deadlines in Member State data submissions.

The EWG recommends that actions be taken to improve the quality of the data. Italian reported data is clearly underestimated, while, the values for some of the parameters submitted by other member states are also in doubt.

The EWG recommends that the mandatory collection and reporting of data is extended to include freshwater aquaculture, thus extending the coverage to landlocked countries.

The EWG recommends to analyze the possibility to do cross checks with other data sources, especially with EUROSTAT data.

The EWG recommends to study the possibility to make the segmentations used by the DCF and by the EUROSTAT data collections more homogeneous. The possibility to link data between different sources would be important to validate the data and get a more accurate picture of aquaculture development in the EU, as well as to ease the work of national administrations in charge of collecting the data.

The EWG recommends that clear guidelines be established for the aquaculture sector data call to allow for establishment of the thresholds for data confidentiality.

The EWG recommends to study the possibility to establish a common conversion index between the quantity of fry production and their weight, for each species and technology.

4. INTRODUCTION

The Expert Working Group 11-14 convened in November 2011 in Ispra (Italy), to produce the 2011 AER on the Economic Performance of the European Union Aquaculture sector. The report compiled involved work by 17 external experts and 5 experts of JRC that attended the meeting, but also work by 4 other external experts who participated via email.

This is the first report of this type that has been produced for the sector. This report provides a comprehensive overview of the latest information available on the structure, social, economical and competitive performance of the aquaculture sector at the national and at the overall EU level.

Data used in this publication stands for 2008 and 2009, and has been collected within the Data Collection Framework (DCF). The data collected is reported by totals and segments. Aquaculture companies and their data, have been classified into different segments made from the combination of the main species produced (salmon, trout, sea bass and sea bream, carp, other freshwater fish, other marine fish, mussel, oyster, clam and other shellfish) and the main technology employed (hatcheries and nurseries, on growing, combined, cages, rafts, long lines, bottom and others). The data analysed covers Income (turnover, subsidies and other income), Personnel costs (Wages and salaries of staff and Imputed value of unpaid labour), Energy costs, Raw material costs (livestock costs and feed costs), Repair and maintenance costs, Other operational costs, Capital costs (depreciation of capital and financial costs), Extraordinary costs, Capital value, Net Investments, Debt, Raw material volume (livestock and feed), Volume of sales, Employment (Number of persons employed and FTE national) and Number of enterprises for the years 2008 and 2009. Moreover, turnover and volume of sales are detailed by species.

The coverage of the data has been very good, with more than 80 % of the production of the whole EU aquaculture sector represented. The main reasons for not accounting for all production is that on the DCF the collection of freshwater aquaculture data is not compulsory, and that the Italian data is clearly underestimated. In fact the underestimation of Italian figures accounts for the loss of about 10 % of the total production. However, other causes are related to the limits of the Data Collection Framework (and previously, the Data Collection Regulation) and not the call in itself. Considering these limitations, the coverage of this report exceeds the mandatory coverage from the data call, thanks also to the fact that most Member States have also reported freshwater aquaculture data. However, some

Member States did not provide all the necessary data to estimate all the economic performance indicators. Data submitted have been checked by the JRC and the national experts that elaborated this report. Still, some of the data submitted raises some concerns, and these cases have been highlighted in the report. This is normal considering that this is the first time the DCF aquaculture data has been requested and the analysis of the sector has been done under the STECF. Therefore, results should be considered with some caution. We would like to remind that Member States are the responsible for the quality and completeness of the data (Council Regulation (EC) No 199/2008).

The 2011 Annual Economic Report on the EU Aquaculture sector is structured as follows. The rest of this section presents the Terms of Reference for this report, lists the experts that participated in the production of this report and analyses the international sources of aquaculture data. It is followed by the overview of the EU aquaculture sector and the Special Topic chapter, "Successful cases in EU Aquaculture". The achievements in the EU aquaculture sector are discussed as area also the main causes of stagnation and the possibilities that EU aquaculture could have in the near future through innovation and technological development. Finally, there follow the 22 national chapters (the 5 landlocked countries are not included in the DCF), the glossary, references and the appendices.

4.1. Terms of Reference for EWG-11-14

Experts are requested to produce the 2011 AER on the European Union Aquaculture sector. During the meeting the JRC will provide experts with draft national chapters that will be assessed and elaborated on by the experts in attendance.

The minimum content of this report will include:

1. Introduction
2. EU overview
3. National chapters
4. Topic of special interest: "Successful cases of EU aquaculture development"
5. Glossary
6. Conclusions
7. Appendices of data tables and quality indicator tables (to be done by JRC following the meeting).

4.2. Participants

STECF members

- Motova, Arina

External Experts

- Avdelas, Lamprakis
- Avdic-Mravlje, Edo
- Borges Marques, Ana Cristina
- Cozzolino, Maria
- Ebeling, Michael
- Guillen, Jordi (chair)
- Kazlauskas, Edvardas
- Lees, Janek
- Moura, Carlos
- Nilsson, Pia
- Pienkowska, Barbara
- Pokki, Heidi
- Reese, Allan
- Sainz de la Torre, Ana
- Stroie, Constantin
- Vassallo, Darcelle

Experts by correspondence

- Dennis, John
- Nielsen, Rasmus
- Oostenbrugge, Hans van
- Paulrud, Anton

JRC experts

- Contini, Franca
- Fiore, Gianluca

- Hofherr, Johann
- Natale, Fabrizio
- Virtanen, Jarno
- Zanzi, Antonella

European Commission

- Calvo Santos, Angel Andres
- Tritten, Christian

The full list of participants at EWG-11-14 with contact details is presented in section 13.

4.3. International sources of aquaculture data

There are other international sources of aquaculture information that could help to complement DCF economic aquaculture data. The two main international sources providing EU data on aquaculture are EUROSTAT and FAO. However, DCF allows for reporting more parameters, and thus a more detailed economic performance analysis.

Note that there exist also national sources of aquaculture data, that have not been considered in this section of the report because of their specific local focus.

4.3.1 Data collected under the DCF

The economic variables to be collected for the aquaculture industry sector under the Data Collection are specified in section A of the Chapter IV and in Appendix XII of Commission Decision 2008/949/EC of the 6th of November 2008, on Adopting a multiannual Community programme pursuant to Council Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy.

Figure 4.1: List of economic variables for the aquaculture sector

Variable group	Variable	Unit
Income	Turnover	EUR
	Subsidies	EUR
	Other income	EUR
Personnel costs	Wages and salaries	EUR
	Imputed value of unpaid labour	EUR
Energy costs	Energy costs	EUR
Raw material costs	Livestock costs	EUR
	Feed costs	EUR
Repair and maintenance costs	Repair and maintenance	EUR
Other operational costs	Other operational costs	EUR
Capital costs	Depreciation of capital	EUR
	Financial costs, net	EUR
Extraordinary costs, net	Extraordinary costs, net	EUR
Capital value	Total value of assets	EUR
Net Investments	Net Investments	EUR
Debt	Debt	EUR
Raw material volume	Livestock	Tonne
	Fish feed	Tonne
Volume of sales	Volume of sales	Tonne
Employment	Number of persons employed	Number
	FTE National	Number
Number of enterprises	Number of enterprises	Number

More detail on the parameters can be found in the glossary (section 8).

Data is asked to be reported by segment and in total. Segments are a combination of the main species cultured and the technology used for their production.

Segments are classified by the following main species:

- Salmon
- Trout
- Sea bass & Sea bream
- Carp
- Other freshwater fish
- Other marine fish
- Mussel
- Oyster
- Clam

- Other shellfish

Segments are also classified by the technology used:

- Fish farming:
    - Land based:
        - Hatcheries and nurseries
        - On growing
        - Combined
    - Cages
- Shellfish farming
    - Rafts
    - Long line
    - Bottom
    - Other

4.3.2. Production data from EUROSTAT

The main sources of production data for aquaculture at EU level are offered by EUROSTAT and FAO. The two organizations work in close collaboration and use the same validation and coding of data.

The statistical data from EUROSTAT includes figures on production and value segmented by country, species and environment (freshwater and marine).

Species are categorized according to ISCCAP codes and the international 3-alpha code.

Through Regulation (EC) No 762/2008, the collection of statistical data on aquaculture by EUROSTAT has been extended to include:

- a segmentation by farming system (ponds, enclosures and pens, cages, tanks and raceways, recirculation systems);
- the input into capture-based aquaculture;
- the production by hatcheries and nurseries and intended uses (for growing or release into the wild);
- the structure of the sector in terms of size of facilities by farming system and environment.

The first data will be available for the year 2008, although some Member States have requested a transitional period of up to 3 years.

Along the same line, FAO declares as objective for the aquaculture database to include data on production units (such as the surface area of ponds, number of cages and number of pens), type of culture (intensive, semi-intensive, extensive) and hatchery production.

By comparing the structure of data of EUROSTAT and DCF some differences emerge in relation to the coding and classification of species and farming systems as outlined in the following table.

Table 4.2: Main differences between classification and coding of species and farming system used by DCF and EUROSTAT aquaculture statistics, respectively.

	DCF	EUROSTAT
Species	Segments are grouped by main species: Salmon, Trout, Sea bass & Sea bream, Carp, Other freshwater fish, Other marine fish, Mussel, Oyster, Clam, Other shellfish	'Species' means the species of aquatic organisms identified using the international 3-alpha code as defined by the FAO
Farming systems	Fish farming Land based Hatcheries and nurseries On growing Combined Cages Shellfish farming Rafts Long line Bottom Other	Production Fish Ponds Enclosures and pens Cages Tanks and raceways Recirculation systems Other Crustaceans Ponds Enclosures and pens Cages Tanks and raceways Other Molluscs On bottom Off bottom Other Seaweed Fish eggs for consumption Other aquatic organisms Hatcheries and nurseries

4.3.3. Trade data

Trade figures are available through EUROSTAT's COMEXT database. The data includes volume and value by country of origin and destination of the trade and by commodities using the CN8 Common Nomenclature.

At global level, in relation to fishery products FAO is promoting the improvement of the Harmonised System (HS) for the classification of products considered in international trade statistics and a new version of the HS classification will enter into force in 2012.

4.3.4. Markets and prices

In 2009, DG MARE launched a project for establishing a European Market Observatory for Fisheries and Aquaculture Products. The report of the first phase on the "state of play analysis" gives an overview of the main data sources available and options for establishing a permanent observatory. The project is expected to be completed by 2012 by setting up, testing and handing over dedicated IT solutions for the market observatory.

Since 2010, FAO is collaborating with the University of Stavanger (Norway), Pontifical Catholic University of Peru and the Norwegian Seafood Export Council to establish a fish price index. The index is representing 57 % of globally traded fish and provides separate indices for captured and aquaculture. The price index is also contributing to another initiative by OECD/FAO aimed at extending to fish the AGLINK-COSIMO model of the global market of agricultural commodities.

4.3.5. List of authorised establishments according to animal health legislation

In addition to the main statistical sources described above, the EU animal health legislation applicable to aquaculture (Council Directive 2006/88/EC) prescribes that lists of authorized establishments should be kept by Member States. In addition, Commission Decision 392/2008 foresees that these lists should be published on the internet. The published lists contain information on the susceptibility to major aquatic diseases, address and geographical coordinates of the farm, type of farming and type of production (mollusc farm open, mollusc farm closed (recirculation), dispatch centre, purification centre, mollusc farming area, research facility, quarantine facility, other; farm or farming area production, hatchery, nursery, grow out, other). While these lists represent a source of disaggregated and spatial data, they are lacking the indication of the species and production quantity, and are using yet a third system of categorization of the farming systems with respect to the ones of DCF and EUROSTAT/FAO.

4.3.6. FAO country profiles

To disseminate information on the global status and trends of the aquaculture sector the Fisheries and Aquaculture Department of FAO compiles and makes available on its web site National Aquaculture Sector Overviews (NASO) and National Aquaculture Legislation Overviews (NALO). These overviews include a description of the main characteristics, structure and resources of the sector, information from FAO fishery statistics on production, market and trade, and a description of the institutional framework and main legislation in each country.

4.3.7. Additional references

The following list provides references to some recent reports analysing the aquaculture sector and fish market in the EU and at global level. Most of these reports, in addition to information and summaries derived from existing statistical data sources, contain valuable analyses and data on the main economic characteristics and outlooks for the aquaculture sector.

- COGEA, 2010. European market observatory for fisheries and aquaculture products, Results of phase 1, executive summary draft
- Ernst & Young 2008. Image survey on the perception of fishery and aquaculture products, Study 1 in the course of the framework contract Lot 3 – studies concerning the implementation of the European Fisheries Fund
- Ernst & Young, 2009. Study on the supply and marketing of fishery and aquaculture products in the European Union
- FAO, 2010. The state of world fisheries and aquaculture, FAO Fisheries and Aquaculture Department, Rome
- FAO, 2010. Synthesis of the Mediterranean marine finfish aquaculture - a marketing and promotion strategy, General Fisheries Commission for the Mediterranean, Studies and Reviews No. 88
- FRAMIAN, 2009. Review of the EU aquaculture sector and results of costs and earnings survey, part 1 of the final report on definition of data collection needs for aquaculture, Ref. No, FISH/2006/15-Lot 6
- JRC, 2008. Prospective analysis of the aquaculture sector in the EU, Part 1: Synthesis report, EUR 23409 EN/12 -2008
- JRC, 2008. Prospective analysis of the aquaculture sector in the EU, Part 2: Characterisation of emerging aquaculture systems, EUR 23409 EN/2 -2008

4.3.8. Conclusions

Under the DCF data collection program there are collected and reported a higher number of parameters, allowing for a more detailed economic performance analysis. However, data on production and data at the site level is not requested under the DCF, while other data sources, such as through EUROSTAT and FAO, report data at a higher level of segment disaggregation. But further segment disaggregation of the economic data collected under the DCF could raise confidentiality issues, since economic data cannot be made public for the segments for which there is an insufficient number of companies.

Although the data collected by EUROSTAT and through the DCF serve two different purposes there could be several advantages in comparing data from these data sources. This is especially the case for this first phase of implementation both for the DCF and for the new regulation on aquaculture statistics. The possibility of linking data between these different sources would be useful to validate the data and to get a more comprehensive and accurate picture of aquaculture development in the EU.

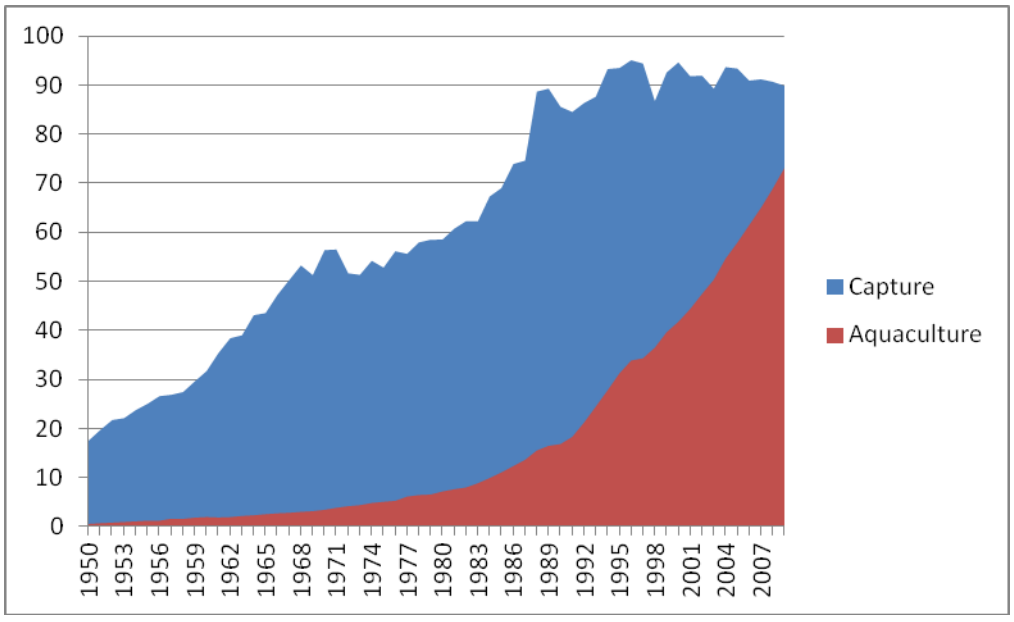
5. OVERVIEW OF THE EU AQUACULTURE SECTOR

5.1. Introduction

Aquaculture should be regarded as an increasingly important contributor to socio-economic development, global food supply and security. Moreover, aquaculture has become something more than an alternative to wild capture fisheries for food production. In fact, FAO estimates than in the year 2030, 65 % of all seafood consumption will come from aquaculture (FAO, 2010b).

Capture fisheries production worldwide accounted for 89.8 million tonnes in 2009, while aquaculture production reached 73 million tonnes. It should be noted though that, of the 89.8 million tonnes, around 24 million tonnes of the capture production were used for non human consumption activities (among others for terrestrial livestock feed and aquaculture), leaving around 65 million tonnes of capture production for human consumption (FAO, 2010b).

Figure 5.1: World seafood production (capture and aquaculture) for the period 1950-2009

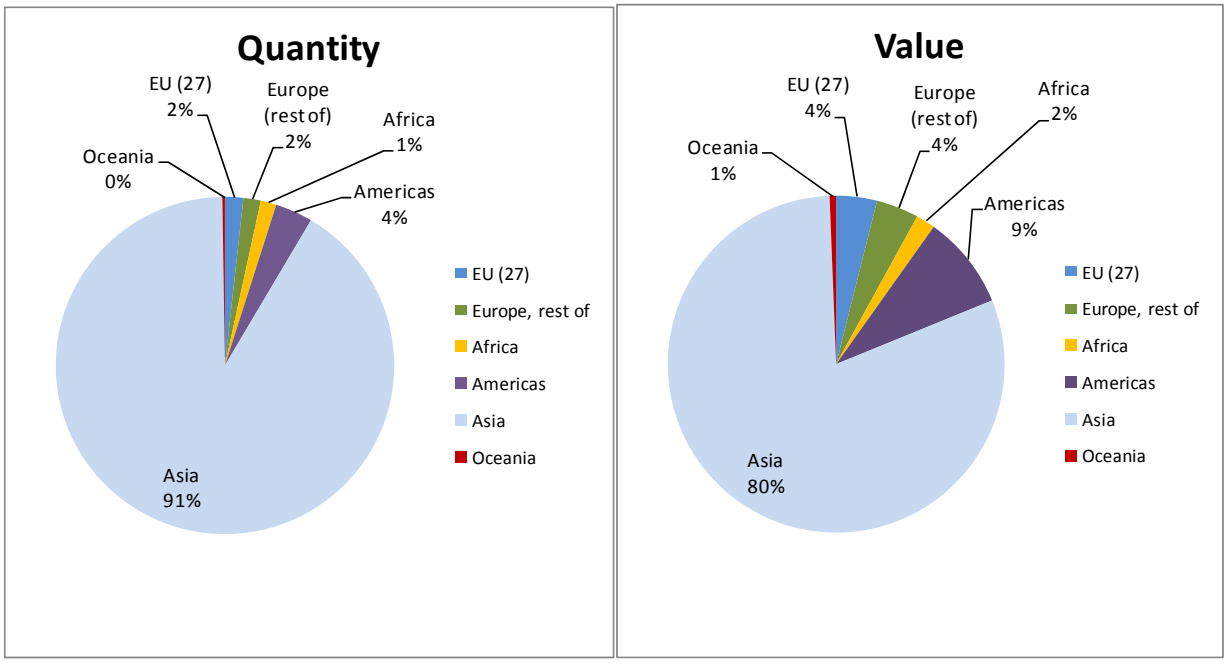


Source: FAO, 2011a; FAO, 2011b.

However, the evolution of both figures is very different. Capture fisheries worldwide reached 90 million tonnes more than 20 years ago. Since then, worldwide production from capture fisheries has been stable or even decreasing. In contrast, aquaculture production has been growing almost exponentially in the last decades. According to FAO, aquaculture production grew in quantity at a 9 % on an annual basis in the 80s and 90s, and at 6 % in the first decade of the XXI century (FAO, 2010b).

This 73 million tonnes of seafood produced with the aquaculture in 2009 are estimated to have a value of more than 88 billion Euros (FAO, 2011a).

Figure 5.2: Aquaculture at Global Level



Source: FAO, 2011a

It can be seen that Asia is the main player in aquaculture worldwide, with 91 % of the production in quantity terms and 80 % in value terms, with China standing for 62 % in quantity and 52 % in value of the world production, followed by Indonesia, India and Vietnam. Norway is the only European country situated in the top 10 aquaculture countries, the 10th in volume and the 7th in value (FAO, 2011a).

The species with the largest aquaculture production worldwide in 2009, in quantity terms, were the alga wakame (*Undaria pinnatifida*) with 4.9 million tonnes, followed by the grass carp (*Ctenopharyngodon idella*) with 4.1 million tonnes. In value terms, were the whiteleg shrimp, also known as Pacific white shrimp, (*Litopenaeus vannamei*) with 7,374 million Euros and the Atlantic salmon (*Salmo salar*) with 5,140 million Euros (FAO, 2011a).

It should be noted that that Asian aquaculture includes much small-scale production for very local consumption (i.e. local markets selling live fish). In addition, Asia's significant dominance can be explained by the culture of alga. In fact, it could be argued that it is not reasonable to compare weights of alga and fishes –as farm production is not report by summing tonnes of corn and beef, though it might be reported "meat production" by summing beef, pork and poultry.

The EU (27) is a minor player in the aquaculture production, in both, volume and value, being 2 % and 4 % respectively. Non-EU European countries (mainly Norway and followed by Turkey) also produce 2 % in volume and 4 % on value of the worldwide production (EUROSTAT, 2011a).

5.2. The EU aquaculture sector

EU aquaculture production accounted in 2009 for 1.30 million tonnes (EUROSTAT, 2011a)[1]. FAO estimated the value of the EU aquaculture production around 4.30 billion US$[2].

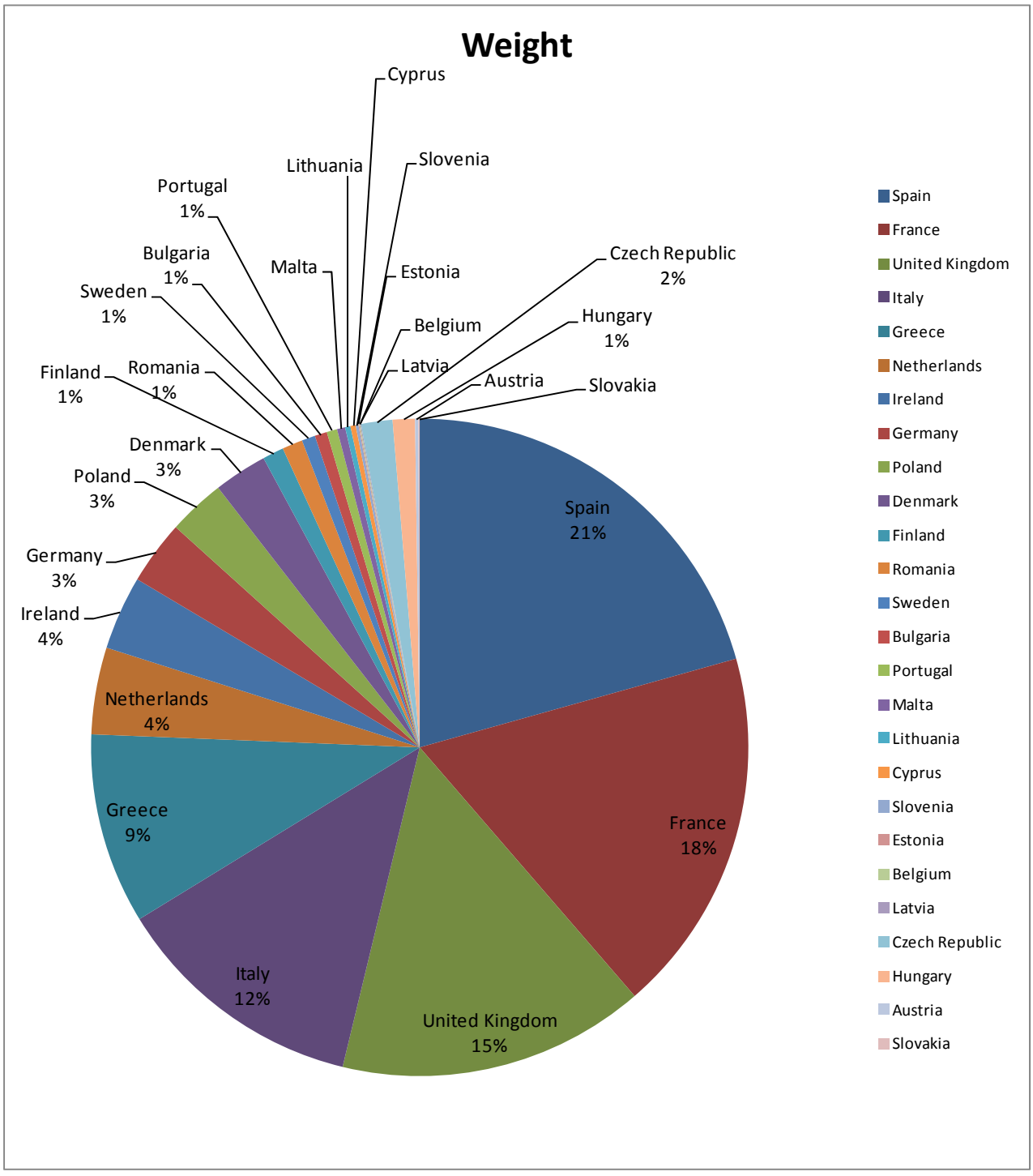
In the EU, Spain is the largest producer, in terms of weight, with 21 % of the total aquaculture production, followed by France with the 18 %, United Kingdom with 15 %, Italy with 12 % and

[1] Total EU (27) landings from capture fisheries (including inland waters) accounted for 5.07 million tonnes (EUROSTAT, 2011a).

[2] Equivalent to 3.1 billion Euros using Eurostat's Exchange rate for 2009 (EUROSTAT, 2011b). It should be also noted that FAO does not provide aquaculture data for Cyprus, so this total value reported does not take into account Cyprus.

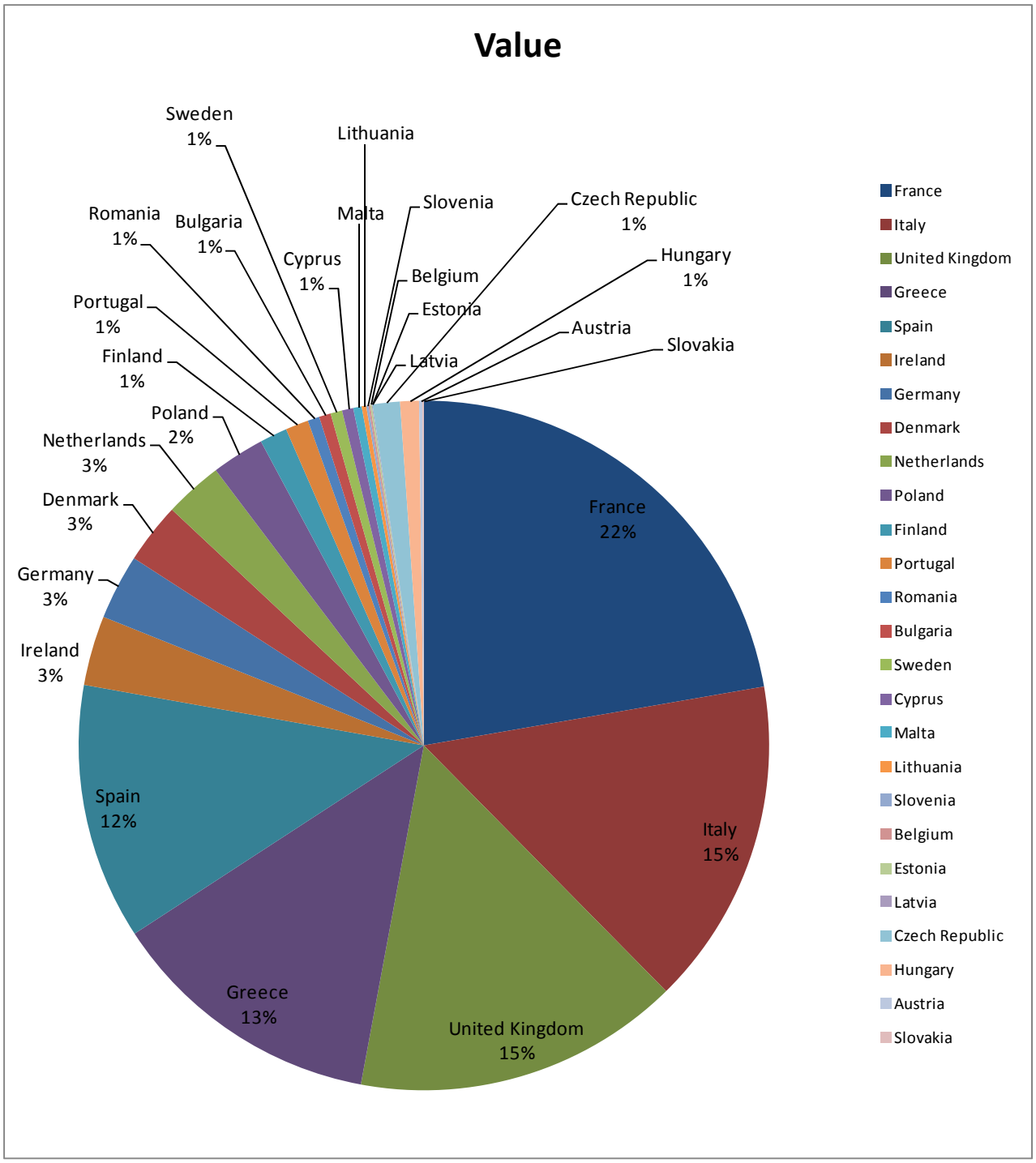
Greece with 9 % (EUROSTAT, 2011a). These 5 countries represent more than ¾ of the total EU aquaculture production in value.

Figure 5.3: Aquaculture in EU per MS (in weight)



Source: EUROSTAT, 2011a

Figure 5.4: Aquaculture in EU per MS in value terms

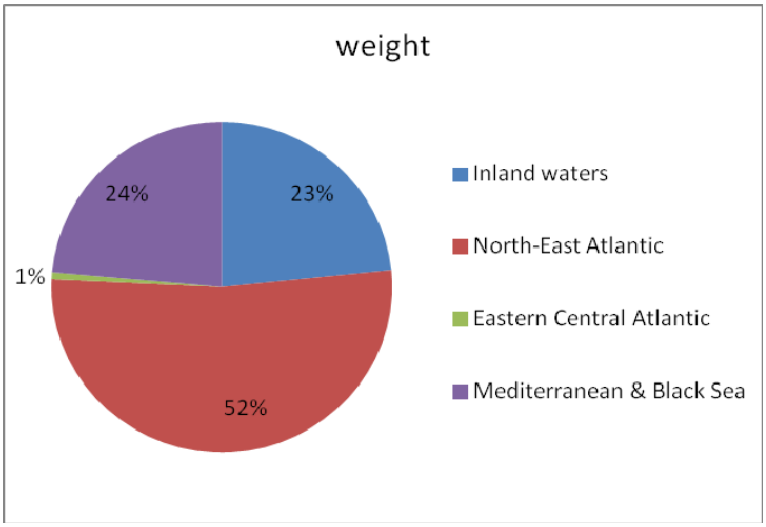


Source: FAO, 2011a

In terms of value France is the largest producer with the 22 % of the total EU aquaculture production, followed by Italy and the United Kingdom with 17 % both, Greece with the 13 % and Spain with the 12 % (FAO, 2011a). These 5 countries represent more than ¾ of the total EU aquaculture production in value. The aquaculture production in the other EU countries represents 3 % or less in value than the total EU production.

From figure 5.5, it can be seen that the marine aquaculture represents the 77 % in weight of the total EU aquaculture production. EU marine aquaculture takes place mainly in the North East Atlantic and the Mediterranean Sea.

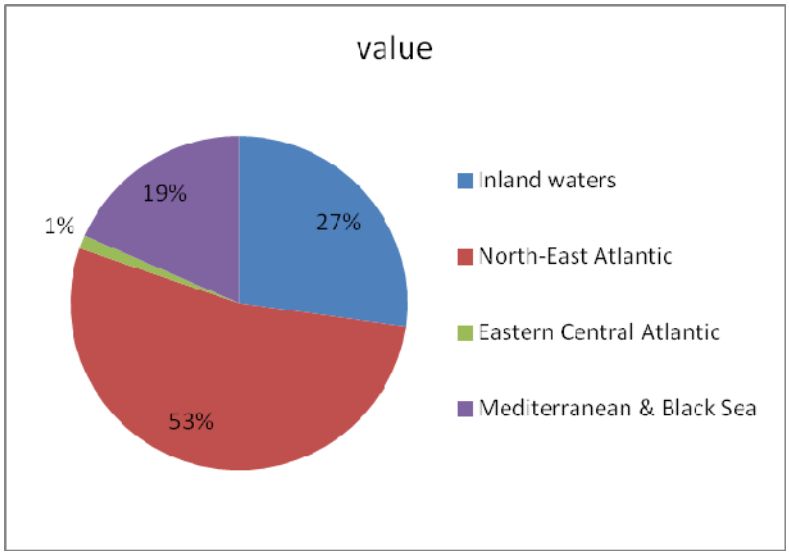
Figure 5.5: Production weight breakdown by region



Source: Eurostat, 2011a

In value terms (figure 5.6), it can be seen that the inland aquaculture represents the 27 % in value of the total EU aquaculture. In the EU marine aquaculture it can be highlighted the North-East Atlantic production that represents a 53 % of the total value, followed by the Mediterranean production (19 % in value).

Figure 5.6: Production value breakdown by area



Source: Eurostat, 2011a

5.2.1. Coverage of the data collected under DCF

As it has already been specified, the economic performance analysis of the EU aquaculture sector carried out in this report it is done based on the economic variables collected for the aquaculture industry sector under the Data Collection Framework (Commission Decision 2008/949/EC).

Under the DCF, the collection of fresh water species is not mandatory. Therefore, data was not requested to the five EU landlocked countries (Austria, Czech Republic, Hungary, Luxemburg and Slovakia). In 2009, these 5 countries represented 2.86 % of the total EU aquaculture production in weight. Czech Republic produced 20,071 tonnes, Hungary 14,171 tonnes, Austria 2,142 tonnes and Slovakia produced 823 tonnes (EUROSTAT, 2011a). Moreover, Belgium, Latvia and Lithuania provided no data on the data call, because they claimed that all their aquaculture production is freshwater based (or the marine aquaculture was so limited that could not be reported due to confidentiality issues). In 2009, Belgium produced 576 tonnes, Latvia 517

tonnes and Lithuania 3,428 tonnes (FAO, 2011a). Their production represented the 0.35 % of the total EU production.

Some Member States submitted data, but not on the freshwater aquaculture segments: Germany, Poland and Slovenia. Freshwater aquaculture accounted in 2009 for 36,257 tonnes in Germany, 36,503 tonnes in Poland and 930 tonnes in Slovenia (FAO, 2011a). These freshwater productions account for 5.67 % of the EU aquaculture production.

Another issue on the data is that Italian aquaculture production reported under the DCF seems underestimated, especially when comparing the 162,325 tonnes reported as production by EUROSTAT and the 162,315 tonnes reported by FAO to the 32,458 tonnes submitted as total sales volume under the DCF in 2009. It should be noticed that production and total volume of sales are not the same variable, but they are highly correlated, and in both 2008 and 2009 there has been this mismatch in Italian figures. This misreporting is responsible of a lack of coverage of the 9.99 % of the EU aquaculture production.

Therefore the data analysed in this report represents more than the 80 % of the production of the whole EU aquaculture sector. The reasons for not having a full coverage is that DCF data collection is not applicable in the EU landlocked countries, freshwater aquaculture is not compulsory in the DCF, and Italian data is clearly underestimated. Moreover, not all Member States have reported all variables requested, so, it has not been possible to estimate all economic performance indicators for each Member State.

So, when during the report we make any statement regarding the EU aquaculture sector, we refer to this 80 % of the production of the whole EU aquaculture sector that we have coverage for; unless otherwise specified.

5.2.2. Economic performance of the EU aquaculture sector

On table 5.1, it is reported the number of enterprises, total sales volume, turnover, employment measures in FTE and mean wages for the analysed EU countries in 2009.

The values reported in table 5.1, have been complemented with EUROSTAT and FAO data, as well as expert knowledge, mainly to overcome the lack of some Member States freshwater aquaculture data. Whenever data has been complemented, it has been detailed with a subscript on the data (see explanations below table 5.1).

Table 5.1: Economic Indicators for the sector

Country	Companies (number)	Total sales volume (tonnes)	Turnover (000 Euro)	Employment in FTE (number)	Annual mean wage (Euro)
Belgium	108 [c]	576 [a]	2,714 [b]		
Bulgaria	336	3,266	8,431	1,375	2,150
Cyprus	12	4,083	19,831	243	11,768
Denmark	160	45,877	134,971	360	59,204
Estonia	11	421	1,048	20	13,980
Finland	259	18,963	57,383	347	39,521
France	2,986	265,399	760,067	3,690	
Germany	[d]	48,000 [c]	205,000 [c]	[d]	[d]
Greece	1,040	117,925	392,114		
Ireland	303	47,408	106,566	976	29,693
Italy	754 [e]	162,325 [a]	474,003 [b]		10,365
Latvia		517 [a]	1,122 [b]		
Lithuania	21 [c]	3,421 [c]	6,628 [c]		
Malta	6	6,300	48,000	145	25,000
Poland	1,177 [c]	38,854 [c]	88,356 [c]	[d]	[d]
Portugal	1,454	6,208	37,250	1,227	7,330
Romania	315	7,292	13,896	2,542	3,332
Slovenia	[d]	1,685 [a]	3,073 [b]	[d]	[d]
Spain	3,105	268,600 [c]	440,028	6,231	17,655
Sweden	191	10,363	29,383	79	53,677
Netherlands		46,000	62,336	255	34,242
United Kingdom	442	197,000 [b]	439,000	6,000	9,667
Total EU	12,680	1,300,482	3,331,200	23,490	13,749

[a] EUROSTAT 2011a data

[b] FAO 2011a data

[c] Expert data

[d] Only data from marine aquaculture has been made available, so it has been excluded from this table

[e] According to the National Program 2011-2013

Data on total volume of sales and value of production for Belgium, and Slovenia have been replaced by EUROSTAT production figure and FAO value of production in order to account for

freshwater aquaculture. Slovenia reported under the DCF for marine aquaculture a total volume of sales of 380 tonnes and a value of 711 thousand Euros. Data from Italy have been replaced also with EUROSTAT and FAO data to overcome the misreporting in the data collected under the DCF. In fact, Italy reported under the DCF a total volume of sales of 32,458 and a value of 95,804 thousand Euros (a 20 % of the EUROSTAT and FAO data on weight and value terms).

Data on total volume of sales and value of production for Germany, Lithuania and Poland have been replaced by data provided by the expert in order to account for freshwater aquaculture. Experts from Lithuania and Poland have also provided data on the total number of enterprises. Germany reported under the DCF for marine aquaculture a total volume of sales of 3,960 tonnes and a value of 5,016 thousand Euros; while Poland reported under the DCF for marine aquaculture a total volume of sales of 1,057 tonnes, a value of 2,882 thousand Euros and 7 companies.

There have been identified 12,680 companies, but with the missing data from Latvia and the Netherlands, as well as from Germany and Slovenia that only provided data for the marine sector, and so these data have not been included in these overall national analysis. It is likely that there are between 14 and 15 thousand companies with aquaculture as their main activity in the EU.

Turnover for the EU aquaculture sector has been estimated in 3.33 billion Euros; that turns into 3.42 billion Euros when accounting also for the EU landlocked countries.

The aquaculture sector produces more than 80,000 direct employments (70,258 reported under the DCF, but missing Belgium, Latvia, Lithuania, the ones from the freshwater sector for Germany and Slovenia, while Poland estimates 5,642 employments on freshwater aquaculture). Women account for the 25 % of the EU aquaculture sector employments. In FTE terms, the employment is 23,490 (missing Belgium, Greece, Italy, Latvia, Lithuania, as well as Germany, Poland and Slovenia that did not provided freshwater data, and the marine sector data has not been accounted). The significant difference between the employment in numbers and in FTE

shows the existence of an important part-time occupation in the sector, since the employment in FTE terms is equivalent to the 38 % of the total number of employees.

The average annual salary in the EU aquaculture sector in 2009 was of almost 13,750 Euros. But the average annual salary oscillated enormously by country; the average salary goes from the 2,150 Euros per year in Bulgaria to the 59,204 in Denmark.

Table 5.2: Economic Performance Indicators for the EU aquaculture sector

	Gross Added Value (000 Euro)	EBIT (000 Euro)	Return on investment (%)	Labour productivity (000 Euro/FTE)	Capital productivity (%)
Belgium					
Bulgaria	-16,454	-20,122	-77.5	-12.0	-63.4
Cyprus	7,445	5,185	14.6	30.7	21.0
Denmark	28,007	-1,206	-0.6	77.8	14.9
Estonia	422	150	3.7	21.1	10.4
Finland	20,935	4,537	5.6	60.3	25.7
France					
Germany	2,682	452	3.2	383.1	18.7
Greece					
Ireland	33,931	1	0.4	34.8	20.3
Italy	45,277	26,151	20.1	29.8 [f]	34.7
Latvia					
Lithuania					
Malta	-22,000	-36,000	-200.0	-150.0	-125.0
Poland	1,005	321	4.2	19.0	13.3
Portugal	16,337	6,913	3.7	13.3	8.7
Romania	25,067	13,763	7.8	9.9	14.3
Slovenia	2,118	1,379	45.1	66.1	69.3
Spain	71,006	-65,315	-12.5	11.4	13.6
Sweden	13,612	10,767	30.9	172.3	39.0
The Netherlands	40,273	24,799	12.7	157.9	20.6
United Kingdom					
Total EU	269,663	-28,226	-1.6	17.5	15.1

[f] Calculated using the total employment

The EU aquaculture sector provided in 2009 a Gross Added Value of 269.7 million Euros (data from 16 MS), with missing data from Belgium, France, Greece, Latvia, Lithuania and the United Kingdom, that did not allow us to calculate the indicator for these countries. Data from Germany,

Poland and Slovenia is only from the marine sector. It is also relevant to consider that Bulgaria and Malta had a negative GVA.

The Return On Investment was - 1.58 % in 2009, calculated using data from 16 MS, with missing data from Belgium, France, Greece, Latvia, Lithuania and the United Kingdom that did not allow us to include them in the calculation of the indicator. However, 2008, the ROI calculated using data from 12 MS was - 3.09 %. In this case with missing data from the previous 6 countries (Belgium, France, Greece, Latvia, Lithuania, and the United Kingdom) as well as Germany, Poland, Portugal and Romania. If we only consider these 12 MS for which data is available in 2008, then the 2009 ROI would be - 3.56 %, showing a reduction on the profitability.

Direct subsidies accounted for 22.3 million Euros in 2009 (data from 17 MS); without these subsidies the profitability instead of - 1.58 % (data from 16 MS) would have been - 2.84 %.

The average labour productivity of the EU aquaculture sector is almost 17,500 Euros per FTE (3,750 Euros higher than their salaries) and the capital productivity is the 15.1 %.

The Future Expectations Indicator (the ratio of the difference between net investments and depreciation against the total value of assets) has gone from 2.4 % in 2008 to 1.2 %, showing a reduction on the investment rate in the EU aquaculture sector. This indicator shows the investments (growth) of the sector: The current low investment levels confirm the process of stagnation that the EU aquaculture sector is suffering. The indicator has been constructed using the data from 16 MS, the ones that reported the necessary parameters (net investments, depreciation and the total value of assets) for both years, so from the calculation is missing Belgium, France, Greece, Latvia, Lithuania, Poland, Portugal, Romania and the United Kingdom data.

5.3. The Structure of the sector

EU aquaculture production can be classified in 3 big groups: shellfish, marine and freshwater aquaculture. Out of the about 14,000 to 15,000 companies that the EU aquaculture sector is composed, and 12,703 companies reported in this study, the number of companies disaggregated up to the segment level has been 9,852 (77.6% of all the companies reported in the study).

From these 9,852 companies reported, 79% belong to the shellfish segment, 6% to the marine and 15% to the freshwater aquaculture. In terms of turnover, 39% belong to the shellfish segment, 40% to the marine and 21% to the freshwater aquaculture.

However, it should be noted that apart from the data missing from several countries, the freshwater aquaculture is underestimated in comparison to the other ones, since the reporting of freshwater aquaculture was not compulsory. Thus, in order to avoid wrong conclusions due to these underestimations, we are going to base our analysis in ratios (weighted indicators) rather than in the parameters themselves.

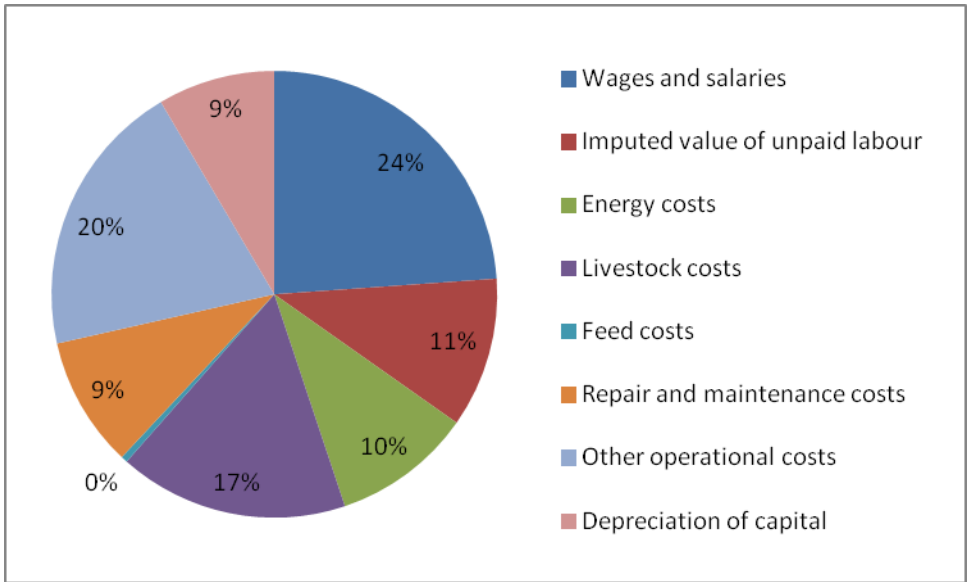
Shellfish aquaculture

The shellfish aquaculture subsector is mainly based on the production of mussels, oysters and clams. It has a very low number of FTE per firm (1.21), which implies that in most of the cases is just one person-employee that works in the company. The turnover per FTE accounts for 91,122 Euros per FTE and the production sales volume is 58.4 tonnes per FTE. The average price of the sales is 2,142 Euros per tonne.

Table 5.3: EU aquaculture shellfish subsector

Country	N. of firm	FTE	Turnover	Volume
Belgium				
Bulgaria			252546	294
Cyprus				
Denmark	15	18.0	1681663	2534
Estonia				
Finland				
France	2623	3287.5	569810960	218036
Germany	12	7.0	5015781	3960
Greece	604		9012000	21211
Ireland	263	776.5	34573421	33566
Italy			59882741	26594
Latvia				
Lithuania				
Malta				
Netherlands		255.0	62335622	46000
Poland				
Portugal	1365	921.0	22876980	3315
Romania	1	1.0	66228	11
Slovenia	9	16.1	219437	315
Spain	2835	3631.0	116440378	
Sweden	48	21.5	1117825	2128
United Kingdom				
Grand Total	7775	8934.6	883285582	357963

Figure 5.7: Costs breakdown for the EU shellfish aquaculture subsector



The main costs in the EU shellfish aquaculture subsector are salaries (wages and salaries, and imputed value of unpaid labour) that represents 35% of all the operational costs, followed by the other operational costs (20%) and the livestock costs (17%). Feed costs represent 0% since most of the techniques for shellfish culture rely on the natural feeding from the environment.

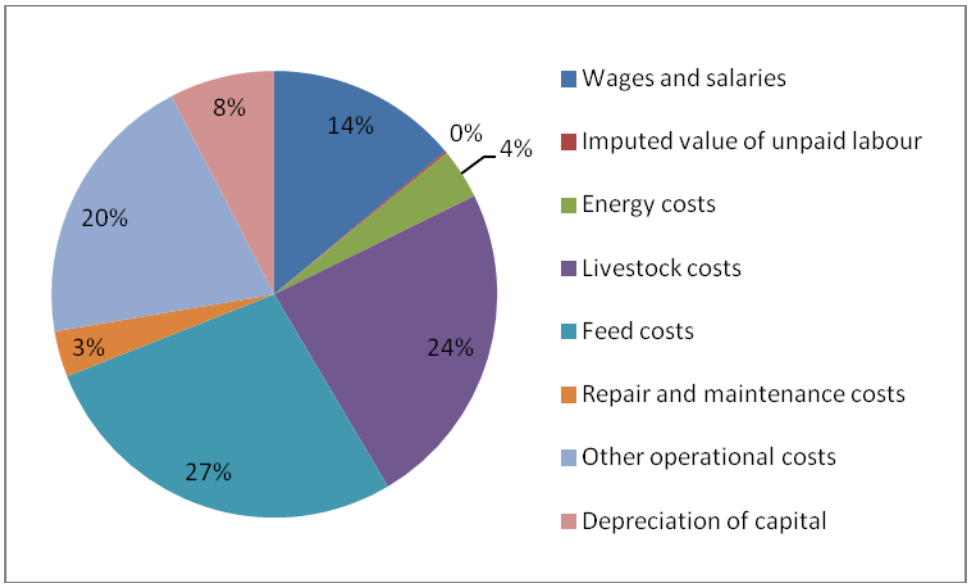
Marine (saltwater) aquaculture

Sea bream and sea bass, and salmon are the main groups of species cultured by the EU marine aquaculture subsector, but many others are also produced (i.e. turbot, sole, mullets, char). This subsector has a very relatively high number of FTE per firm (9.13), often related to the high investments in the company. The turnover per FTE accounts for 171,148 Euros per FTE and the production sales volume is 37.1 tonnes per FTE.

Table 5.4: EU aquaculture saltwater subsector

Country	N. of firm	FTE	Turnover	Volume
Belgium				
Bulgaria				
Cyprus				
Denmark				
Estonia				
Finland				
France	30	78.5	44233686	4672.34
Germany				
Greece	336		457840823	405765255
Ireland	29	161.5	67241533	12407
Italy			19198518	1288
Latvia				
Lithuania				
Malta	6	145.0	47917655	6332
Netherlands				
Poland			242074	
Portugal	77	271.0	13221184	2375
Romania				
Slovenia	2	16.0	491318	65
Spain	111	1870.0	265542555	
Sweden	27	32.0	1894984	261
United Kingdom				
Grand Total	618	2574.04	917824329.5	405792654.6

Figure 5.8: Costs breakdown for the EU saltwater aquaculture subsector



The main costs in the EU marine aquaculture subsector are feed costs that represent 27% of all the operational costs, followed by the livestock costs (24%) and other operational costs (20%). Even this is the aquaculture subsector with more workers per firm, the salary costs (wages and salaries, and imputed value of unpaid labour) represent only the 14% of the total costs, because the techniques used and the investments required implied that the production is more intensive.

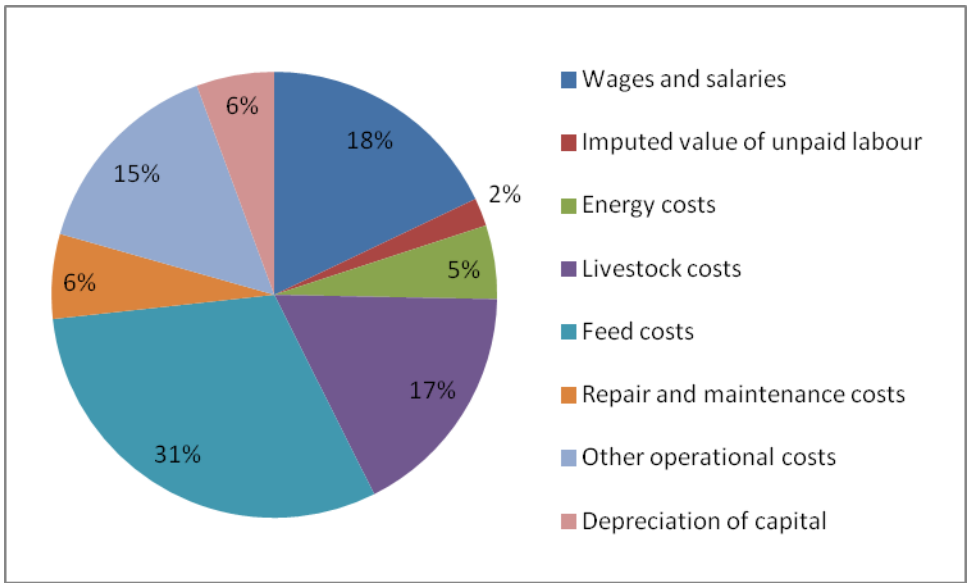
Freshwater aquaculture

The freshwater aquaculture subsector is mainly based on the production of rainbow trout and carps, but other species are also raised (i.e. tench, eels). This subsector has a medium number of FTE per firm (3.30). The turnover per FTE accounts for 98,163 Euros per FTE and the production sales volume is 30.60 tonnes per FTE.

Table 5.5: EU aquaculture freshwater subsector

Country	N. of firm	FTE	Turnover	Volume
Belgium				
Bulgaria			8575232	3148
Cyprus				
Denmark	141	334.0	131766539	42849
Estonia	11	20.0	1048404	422
Finland	259	347.0	57383236	13314
France	333	324.1	146022172	42690.66
Germany				
Greece	100		10626732	2772
Ireland	13	38.0	4751447	1436
Italy			16723139	4576
Latvia				
Lithuania				
Malta				
Netherlands				
Poland			2640133	
Portugal	12	35.0	1151441	518.03
Romania	314	2541.0	13830257	7281
Slovenia				
Spain	159	679.0	58044838	
Sweden	117	168.0	26370577	7973
United Kingdom				
Grand Total	1459	4486.1	478934147	126979

Figure 5.9: Costs breakdown for the EU freshwater aquaculture subsector



The main costs in the EU freshwater aquaculture subsector are feed costs that represent 31% of all the operational costs, followed by salaries (20%, considering wages and salaries and imputed value of unpaid labour), the livestock costs (17%) and other operational costs (15%).

6. SPECIAL TOPIC: SUCCESSFUL CASES IN EU AQUACULTURE

6.1. Introduction

Growth in the aquaculture sector is desirable, because the demand for fish is increasing[1]; the capture fisheries have stagnated and the dependency on imported fish is growing inside the EU. It has also been argued that since aquaculture provides an alternative to wild capture fisheries, it can alleviate fishing pressure and help to preserve fish stocks (Science, 2011).

Growth in aquaculture has been on the political agenda for a long time in most Member States, the EU and the OECD, as a solution to increase the seafood supply and creating growth and jobs, both on the primary industry and the down-stream industries. However, over the last 20 years the growth in the EU and most OECD countries has stagnated.

6.2. Stagnation of the EU aquaculture

In fact, aquaculture production worldwide will continue to increase. Aquaculture has started to adopt technology from agriculture (and the salmon industry), and there is a tremendous scope for further productivity growth (Asche, 2008).

As it happens for all biological production processes, aquaculture creates environmental risks and challenges. Asia is dominating the aquaculture production worldwide (followed by South America); while EU and North America are already lagging behind. It seems that this trend will continue since the vast majority of the most developed countries are not willing to take the risks necessary to use new technologies (Asche, 2008).

[1] As shown by Delgado *et al*. (2003), demand for seafood should grow because of increased economic growth and increased global population.

Worldwide, there are strong concerns about the environmental impact of aquaculture (Burridge et al., 2010). Aquaculture, if not properly managed can alter and even destroy ecosystems and release large quantities of nutrients and pollutants to the water. Studies have related overfeeding in fish farms with changes in the benthic communities (Stenton-Dozey, 1999). Fish excretions combined with excess of nutrients can create an eutrophication of the water. In addition, chemicals, such as antibiotics and water treatment agents, are commonly used in the aquaculture sector. Finally there is the risk of fish escaping from farms into the wild ('farm escapees').

In fact, a high number of salmon escaping from aquaculture worldwide indicates that "farm escapees" is a genuine concern (Naylor et al., 2005). Specifically the risk of the potential genetic impact of fish farm escapees on wild populations (genetic introgression) has been addressed by scientists (Utter and Epifanio, 2002) as well as regulators (e.g. (Fisheries, 2010)). The ongoing domestication process of cultured aquatic species introduces a risk of genetic impacts from aquaculture on wild populations. This encompasses restocking practices. The interaction between farmed and wild aquatic animals may induce effects that depend on factors such as genetic diversity, local adaptation, behaviour and relative abundance of farmed and wild counterparts. The worry is that fish having escaped from farms might reproduce with wild fish of the same species and thus lower the fitness of wild fish populations. This subject has recently been extensively addressed by a report published by the Genimpact consortium (Svåsand et al., 2007). Since experimental evidence of effects of interbreeding between wild and farmed individuals on genetic structure, fitness and productivity of wild populations is insufficient the Joint Research Centre recently started the project AquaGen (http://aquagen.jrc.ec.europa.eu) on the subject, and also a newly published FP7 call[2] addresses the subject, stressing its importance.

As stated by many experts, researchers and producers, the slow development of EU-Aquaculture is not mainly due to a bad market situation or unfavourable natural conditions. The main reason has been the difficulty to integrate environmental policy with viable aquaculture economy, due to

[2] KBBE.2012.1.2-12: Providing molecular tools for assessing and monitoring the potential genetic impact of aquaculture on native populations (The Ocean of Tomorrow). Call: FP7-KBBE-2012-6.

the concerns on the environmental impact of aquaculture. Consequently, the economic performance of the industry has weakened. There is a clear need for a better and more coherent governance and management to facilitate the development of responsible and sustainable aquaculture in the EU. Solutions may pass through reducing the delay in the licensing process and reducing the complexity of transposing and applying the EU legislation (European Parliament, 2009)

Moreover, in order to compete in the global market with current competition from third countries (most of them with lower labour and control costs) there is the need to increase and intensify production to achieve economies of scale. However, the intensification of the EU aquaculture production is limited by the regulation (it affects the environmental impact). In addition, there are also restrictions on the use of feed, since the use of feed is also proportional to the environmental impact (pollution) of the activity.

Finally, it should also be pointed out that often the locations to develop aquaculture farms are not available or restricted on size (due to their environmental impact). This happens because of the existence of high living standards in the EU and the use of the territory for other uses (i.e. recreational ports, touristic uses, natural uses) in competition with aquaculture.

6.3. Achievements of the EU aquaculture sector

Even if the EU aquaculture is suffering from stagnation, the EU aquaculture sector is responsible of several achievements:

- Increase the production and supply of seafood.
- Job creation and diversification of the economic activity in coastal communities.
- Increase the value added of capture fisheries catches.
- Development of new products: for human consumption and other industries.

6.3.1. Increase production: Seabream and seabass in the Mediterranean

There has been several cases where the EU aquaculture sector has managed to increase enormously the production of a species to supply its own market (i.e. trout, seabass, seabream).

Seabass and seabream aquaculture (hatchery production and farming) can be considered as a successful story for the European aquaculture industry. Artificial breeding was successfully achieved in Italy in 1981-82, and large scale production of seabream juveniles was definitely achieved in 1989-90 in Spain, Italy and Greece.

Greek production started slowly in the early 80's, 42 tonnes were produced in 1984, valued 375 thousand ECU, to reach the production value of 353 million Euros in 2007 and production volume of 94,000 tonnes in 2009. The shape of the Greek coastline, the availability of subsidies from the European Union and well trained technical personnel contributed to the development of a new industry in Greece.

During the period of expansion, the Greek seabream and seabass industry faced multiple challenges, among others, use of coastal space, environmental concerns, technological constrains, scarcity of working capital, cyclicity of the market. Excessive supply during 2002-2003 and 2008-2009 affected profitability thereby starting a series of acquisitions and concentration of production to large vertically integrated enterprises.

Despite the relative small contribution of aquaculture to the Greek Gross Domestic Product, after three decades of expansion, the contribution of the seabream and seabass aquaculture industry in the Greek primary production is significant both in terms of production value and in terms of external trade. Greek exports of fishery products follow the trend of the seabream and seabass production value. So, the seabream and seabass production contributes to an overall external trade surplus for fishery products in Greece since 2003. On top, the industry provides employment thereby preserving cohesion in coastal and remote areas.

The future of the seabream and seabass industry depends mainly on expanding to non traditional markets and compete with species such as salmon and pangasius. Technological constrains need

to be addressed aiming to the reduction of production costs for the industry to grow further. This costs reduction is necessary to compete with other species as well as supply of seabream and seabass from non-EU countries (mainly Turkey, but could be easily followed by other Mediterranean basin countries). However, so far, lower personnel costs have been often compensated by higher transport costs. Research and innovation seem to be the key for further expansion. In this process, Common Fisheries Policy and the European Fisheries Fund may play a major role.

6.3.2. Scottish salmon

Before the 1970s fresh or frozen salmon was a luxury and seasonal product for most UK consumers (Susan Shaw (1987) Salmon: Economics and marketing. Croom Helm). The "cod wars" of the 1970s and the introduction of 200 mile fishing limits brought to public attention the issue of competition between nations for marine food resources. The technique of farming salmon in marine net cages was developed in Norway in that period and by the 1980s was spreading widely (http://www.fao.org/fishery/culturedspecies/Salmo_salar/en). The development of salmon farming in Scotland made the product far more widely available in the UK at a price that has decreased greatly in real terms; compared to chicken, salmon went from being ten times as expensive in 1980 to only about twice the price in 2009 (IMF figures). Since the 1990s salmon has also been promoted as a healthy food.

The attitude of the Scottish government and its predecessors is summarized in reports "A Fresh Start: The renewed Strategic Framework for Scottish Aquaculture" (2009) and "A Strategic Framework for Scottish Aquaculture" (2003), both available on the Scottish Government website (http://www.scotland.gov.uk/Topics/marine/Fish-Shellfish/18364). These reports reflect the complex issues and diverse attitudes now surrounding aquaculture: economic growth, food security, employment, rural development, infrastructure, use of resources, environmental impacts (biosecurity, effects on wild stock, pollution), other socio-economic effects (multipliers, tourism, angling), spatial planning and competing uses, etc. The 2003 Framework acknowledged the influence of the EU Common Fisheries Policy (EC 2002), then being extended to aquaculture.

Despite these supportive frameworks, production in Scotland has shown little growth in the last decade. Opposition to expansion was already becoming organised at the turn of the century (WWF (2001) Bitter harvest: a call for reform in Scottish aquaculture http://www.wwf.org.uk/filelibrary/pdf/bitterharvest.pdf) and continues (Herald Scotland 11 Sept 2011 http://www.heraldscotland.com/mobile/business/corporate-sme/salmon-farming-company-expansion-faces-opposition-1.1122965). Competition from Norway led to a price drop mid-decade which influenced business planning. The tendency across the industry has been for consolidation and increased efficiency, so direct employment has declined. Farms have been integrated into commercial groups for better cost control (e.g. by supplying fish food) and higher added value (i.e. processing). The industry cites over-regulation and lack of available sites as the current barriers to growth.

80% of the Scottish production came from five large companies (Marine Harvest Handbook 2010 http://marineharvest.com). The importance of commercial rearrangement rather than physical developments is reflected by two of the five companies named in that 2010 report having since changed ownership. Four of the five are now owned by international groups.

In 2009, Scotland supplied just over 10 % of world production of farmed Atlantic salmon, (Norway supplied the 57 % and Chile supplied the 18 %). Chilean salmon production in 2009 was lower than its average production due to disease outbreaks and accelerated harvesting in 2008.

It should be noted that the exponential increase in production of fresh salmon found a ready market because the product was already familiar and aspirational, convenient to market and prepare, and promoted with a steadily-reducing real cost. Introducing new species to aquaculture faces (at least in many countries) customer resistance on top of any technical difficulties.

6.3.3. Tuna farming

Bluefin tuna (*Thunnus thynnus*) aquaculture began in 1985 in the Mediterranean Sea. Bluefin tuna farming is done by catching wild tuna and fattening the tuna fish in net cages in the sea.

This activity is motivated mainly by the Japanese market, which accounts for 90% of the demand.

This aquaculture practice could be considered from an economic point of view a success, due to its profitability. This practice adds value on the tuna catches, driven by the Japanese market demand for raw fish (sushi and sashimi). This aquaculture production has allowed to i) increase the weight of the tune captures, ii) supply the Japanese market with tuna that has more demanded levels of fat and by doing so increasing the sale price, iii) increase over the year the season where tuna coming from the Mediterranean could be supplied to the Japanese market, and by doing so, it can be avoided periods of oversupply that would bring prices to drop.

However, among other ecological worries, tuna farming seems to have incentivise an increase of tuna captures from an already overexploited stock.

6.3.4. Culture of new species for human consumption or other industries

At this moment, many groups and companies are working developing the culture of new species and techniques. The supply of new species and products in aquaculture helps to diversify traditional capture fisheries and aquaculture supplies, and tries to obtain some determined market niche.

For example, some companies achieved a stable production of eggs for human consumption (caviar from sturgeons and rainbow trout). Also macroalgae production for human consumption has increased in the last years. Other species like blackspot seabream, Pollack, amberjack (*Seriola spp.)* are being cultivated with more or less problems. In the molluscs, octopus is being grown in cages.

Moreover, other industries, such as the pharmaceutical and sanitary ones, are increasing their demand of aquacultured products as inputs in their production processes.

6.3.5. Traditional aquaculture: shellfish gathering

Traditional ways of aquaculture have proven also successful. There are types of aquaculture with very low level use of technology and with low environmental impact that have proven very important to create (maintain) employment in the communities in coastal zones where they are situated.

We can find different examples of this traditional cultures, like the shellfish gathering that is cultivated in the intertidal areas, well spread along the EU coasts.

6.3.6. Organic aquaculture

Organic aquaculture is becoming increasingly important, in the last years, as consumers become more aware of environmental problems of capture fisheries and aquaculture.

However, there is some controversy over what productions can be certified as “organic”. Rules vary worldwide between different countries or certification bodies. In the EU, the Commission Regulation (EC) No 710/2009 sets conditions for the aquatic environment and for impacts on other species. It deals with the separation of organic and non-organic units and specifies animal welfare conditions including maximum stocking densities (a measurable indicator for welfare). It specifies that biodiversity should be respected, and does not allow the use of induced spawning by artificial hormones. Organic feeds should be used supplemented by fish feeds derived from sustainably managed fisheries.

As an example, organic salmon retails at a price premium of around 50% over conventional farmed salmon (DG MARE, 2010).

6.4. Innovation in aquaculture

Generally innovations can happen as product or process innovation. Continuously new marine species are domesticated for aquaculture purposes. Feed ingredients are a large field of research

and application of new ideas, products and processes. New markets are created, new processing technologies are developed.

Currently, pangasius and tilapia are the species with the highest production growth. In a few years, it could well be that other species present higher production growth rates. Barramundi, cobia and grouper are some of the candidates, but it could be species that we still have not heard about. It should be considered that species that are successful today may well disappear in the aquaculture production in a few years (Asche, 2008).

6.4.1. Recirculating aquaculture systems

Even recirculating aquaculture systems are not really new, they are one of the newest forms of fish farming production systems, and they have been evolving significantly in the last years. The techniques using water recirculation systems are typically indoor systems that allow farmers to control environmental conditions all year round.

This recirculation system permits recycling 99 % of the used water. This water is treated biologically in order to eliminate toxic metabolites. All the physic and chemical parameters are controlled to keep the fishes health. This system offers important advantages like isolating the used water from external factors.

Thus, recirculating aquaculture systems manage reduce the pollution and disease that occur in the current fish farming operations. However, costs associated with constructing and managing a recirculating aquaculture systems are typically higher than pond or cage cultures.

The techniques using water recirculation systems are being used so far in a small percentage of establishments, but their number is increasing.

6.4.2. Offshore aquaculture as a co-use option

Additionally, aquaculture development tends to go offshore. This is due to e.g. acceptance problems with near- or onshore plants and corresponding less space in the near shore areas usable for aquaculture production. So, offshore offers a lot more space, but on the other hand much more threats. Understanding offshore as those regions in the open ocean with hard conditions means challenges for material and men. Norway, Germany and France are examples for research projects dealing with this issue.

In Germany, for example, a lot of wind farms are planned in the North Sea EEZ. Together with existing uses like shipping, tourism etc. more and more space is dedicated to specific uses, while fishery and potential aquaculture activity are going to get less and less spatial opportunities. So the idea of co-or multiple uses of spatial areas came up – why not use the space between the wind farm turbines for aquaculture activities? Or what is about the space under the turbines? Some research projects that are currently still going on deal with this idea. Some preliminary results are presented here.

Actually, the space between the turbines is only usable for the wind farm companies. The area round each turbine has to be protected from shipping and activities such as trawling, but could be economically exploited by non-contact use (i.e. providing substrate for spawning or a protected nursery area). As it is more or less unused space, ideas about the possible use as an aquaculture area came up. Ongoing research projects in Germany deal with the commercial feasibility of culturing mussels, macroalgae and different fish species.

6.4.2.1. Offshore technologies

Experiments have been carried on with mussel longlines to assess the growth rates for mussels (*mytilus edulis*) and macroalgae (*Saccharina latissima*). For the fish cages models have been developed in the size 1:40 and have been tested in an artificial flow passage for evaluation of physical impacts on the construction. Other data like price data, food conversion rates, mortality, fish density etc. have been taken from literature, experts or in the case for cost data for land facilities, new vessel and similar issues from supplier acting in the market. For the fish case,

different species have been taken into account, by first assessing the biological feasibility of the species in the North Sea.

For the mussel case enterprise budget and break-even analysis, investment appraisal and sensitivity analysis have been carried out, for the macroalgae enterprise budget and break-even analysis has been carried out and for the fish case only some preliminary results for enterprise analysis are currently available. Figure 6.1 illustrates the fish cage idea, while figure 6.2 shows a scheme of the mussel longline idea.

Figure 6.1: Offshore turbine and fish cage

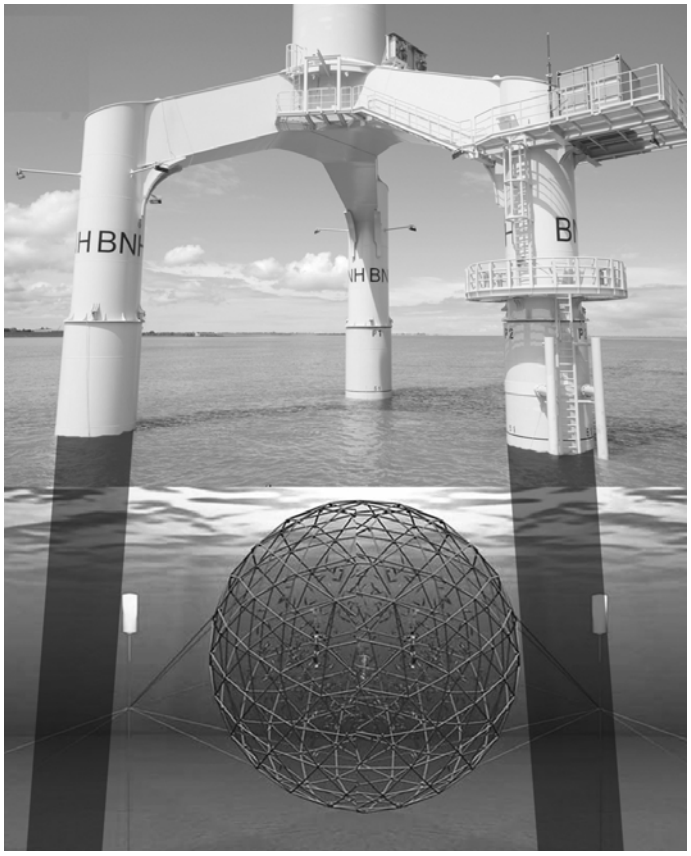


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Figure 6.2: Scheme of mussel longline cultivation in wind farms area

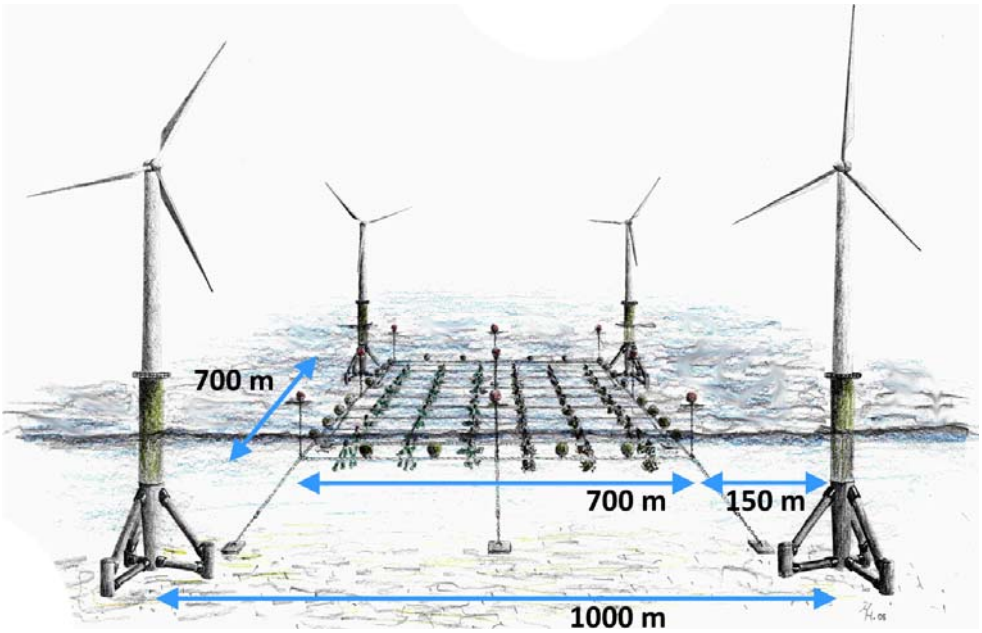

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Figure 6.3. shows a possible longline construction for mussels, while Figure 6.4 shows a ring plant for macroalgae.

Figure 6.3: Scheme of longline construction for mussels

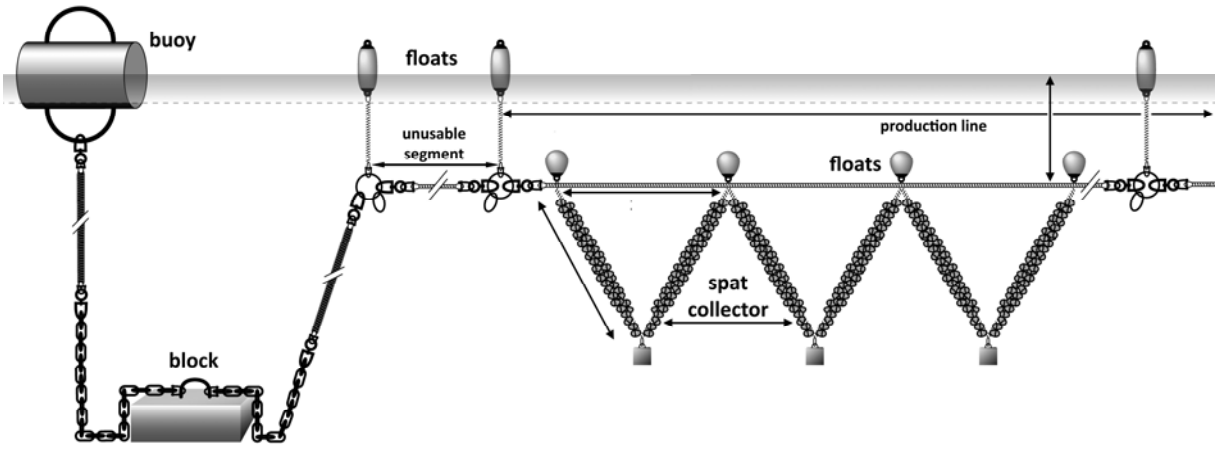

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Figure 6.4: Macroalgae plant ring

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6.4.2.2. Results

For the mussels commercial feasibility could be shown. The break-even price assuming a biomass harvest of 10 kg per meter collector line is 0.52 Euro. Assuming a price of 1 Euro/kg the break-even yield is 5.17 kg. The price of German blue mussels is above 1.20 Euro/kg for the last years, with peaks of 2 Euro/kg last summer (Buck, Ebeling & Michler-Cieluch, 2010).

For the macroalgae, break-even price totals to 460 Euro per tonne of wet biomass, assuming 8 kg/m collector line. The break-even yield, assuming 0.50 Euro per tonne of wet biomass is about 5.3 kg. The break-even price may be reached for small amounts, but in general it is currently above market prices.

Offshore fish cages are quite expensive constructions. It only seems to be feasible with high value species. To get high prices a good marketing strategy should be developed to justify higher prices. Possible candidates are halibut, turbot and sea bass.

The results show a mixed picture concerning commercial feasibility of aquaculture in offshore areas. But some factors may lead to lower costs. These are e.g. synergy effects from the co-use in

wind farm areas, like ship transport and labour sharing. Also cost per unit decreases for the fish cages and the mussel and macroalgae longline constructions may be expected. On the other hand higher prices may be possible due to higher demand for high quality seafood. This could be because of the growing population worldwide, the trend to healthier food, increasing need of biomass for energy purposes or other reasons. In the US-Market e.g. prices of 4,000 $/t of wet biomass have been paid for macroalgae for human consumption. Further market studies to assess possible prices and volumes have to be done.

Further research has to be carried out concerning the physical conditions affecting fishes offshore and if they can withstand it. Real 1-1 experiments in a pilot plant have to be done. Another direction is the separation of valuable ingredients in order to get the most value out of e.g. macroalgae by using also all possible by-products. Only non-usable parts may be used for energy production, collagen, lipids and other ingredients may be extracted beforehand. This integrated multi-use of aquaculture products is another direction of further research. At the end the whole product should be used as it is the case of land animals (e.g. pigs or cows): Some parts are for direct human food consumption, some for cosmetics purposes, some as ingredients for the food processing industry (like gelatin) etc.

Further details on the data, methods and materials will be available soon in the respective publications. For the mussels an article is already published[3], while for macroalgae and fishes publications are forthcoming.

6.4.3. Genetics

In support of the aquaculture industry, genetic selection has been used or suggested to increase production by increasing growth rate and increasing disease resistance. While concerns have been raised about the possibility of genetic corruption of wild stock if escapees interbreed, genetic manipulation has often tried to produce specimens that are unable to breed with the

[3] Buck, Ebeling, Michler-Cieluch. 2010. Mussel cultivation as a co-use in offshore wind farms: potential and economic feasibility, Aquaculture Economics & Management, 14:4, 255-281.

native (diploid) stock (i.e. producing triploid brown trout is used expressly to create fish that can be released for sport fishing but is unable to breed with the native (diploid) stock). However, as seen on section 6.2, the possibility to "pollute" wild fish populations with farmed fish is still an important concern.

Genetic analysis can help to understand, monitor and mitigate the impact of escaped farmed fish on wild populations. It can furthermore be used to develop tools for traceability, identifying farmed fish and even tracing them back to the farm of origin (Glover et al., 2008).

6.5. Conclusions

Aquaculture offers a big potential, both in production (also in value terms) and growth. Currently, the potential of aquaculture is exploited almost entirely outside the EU (especially in China, and Asia in general, with important productions of low value whitefishes and shrimps, among others).

Despite the advances in research and technological development taking place in Europe, that could allow the EU to have a more prominent position in the aquaculture sector often innovations are not brought into practice. The following difficulties can hamper the adoption of innovations in EU:

- Off-shore aquaculture and recirculating aquaculture systems require important investments and maintenance costs. Moreover, they face higher economic risks.
- The important time delay that takes place for the approval (or not) of the aquaculture projects and its costs (i.e. elaboration of studies required) work as a deterrent for entrepreneurs. Moreover, the required initial investments for an aquaculture production are significant, together with the uncertainty about the approval and when this decision would take place, makes the investment in aquaculture not attractive; especially under current credit constraints.
- Often there is a lot of uncertainty (not enough security) for longer term investments, due to possible changes in the regulations regarding environmental, health and safety constraints.

- It should also be taken into account that the increase in the supply of a certain product can produce prices to drop, especially if it is not accompanied with an adequate market strategy. The acceptability of products to consumers and ability to grow a market are also high risk elements in introducing new species. So it is possible that the firsts productions, especially of new species, do not have enough demand and price fall.
- Finally, the adoption of similar technologies/innovations from third countries that do not have faced the research and innovation costs would allow them to produce with lower costs, especially if this takes place in countries with lower cost rates (i.e. salaries, energy, feed).

The success of the EU aquaculture sector depends in great part if current threats that affect the EU aquaculture sector, especially on the adoption of new technologies and innovation, could be removed (or reduced) in the next years. On the other hand, the EU aquaculture sector has shown positive achievements and offers possibilities for development in the future. But for this to happen there are some advantages that the EU aquaculture sector has to exploit:

- There is a well consolidated market chain and the aquaculture products demand is increasing.
- Aquaculture products offer the possibility of supplying the markets with products with uniform quality during the whole year.
- New markets and new consumption trends (i.e. quality brands, organic products).
- Moreover, aquaculture have more flexibility to respond with products (species) to what the consumers' demand.
- In the EU there are R&D groups in aquaculture with very high qualification and capacity, but there is need that these innovations are applied.
- There is an important supply of resources and knowledge in fishery sector. Possibility of taking advantage from them in aquaculture sector.
- Different uses apart from human consumption (i.e. raw material for other establishments, restocking, biotechnologies, pharmaceutical.).

7. NATIONAL CHAPTERS

7.1. BELGIUM

7.1.1. Overview of the sector

Aquaculture production in Belgium is relatively small. There are 108 companies in the Belgium aquaculture sector, but only 3 of them work in marine aquaculture. Most aquaculture production comes from freshwater environments. In 2009, there were produced 576 tonnes (live weight), 83 % of them were freshwater fishes (trout, carp, tilapia and catfish) (FAO, EUROSTAT).

Both, EUROSTAT and FAO data on the Aquaculture production in quantities match. Moreover, FAO also provides data on the value of the production, as can be seen on Table 7.1.1.

Table 7.1.1: Aquaculture production in Belgium 2008-2009 (quantities and values)

	Quantity (t)		Value (000 EUR)	
	2008	2009	2008	2009
Invertebrata aquatica	55	100	367	665
Pisces	71	476	301	2,049
Total	126	576	668	2,714

Source: FAO FishStat Plus and Eurostat for the exchange rates

7.1.2. Data coverage and Data Quality

Belgium submitted no data for the DCF aquaculture data call, since, in the DCF the collection of fresh water species is not mandatory[1]. And there are only 3 companies doing marine aquaculture, so confidentiality issues would arise if that data was reported. In fact, FAO FishStat Plus classifies all Belgian aquaculture as freshwater; Eurostat data confirms that Belgian aquaculture is “inland”.

[1] Section A of the Chapter IV of the Commission Decision 2008/949/EC of the 6th of November 2008, on Adopting a multiannual Community programme pursuant to Council Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy.

EUROSTAT and FAO data on the aquaculture production in quantities for 2008 and 2009 match.

There is no country data for Belgium on the National Aquaculture Sector Overview (NASO) from FAO.

7.2. BULGARIA

7.2.1. Overview of the sector

Bulgarian aquaculture sector comprised 336 companies in 2009. The number of companies increased in 62 from 2008, corresponding to 22.6 % growth. The companies are located all around the country, as private companies. The number of employees in FTE increased in 275 from 2008, corresponding to 25 %, at a total of 1,375 persons. The aquaculture is not a big sector comparing with other ones at national level, amounting 8.43 million Euros in 2009 with an increase of 16.9 % comparing to 2008 which was 7.21 million Euros, as can be seen from Table 7.2.1.

Production increased by 14.4 %, from 2,855 tons in 2008, to 3,266 tons in 2009. Aquaculture is a fresh water land based and the main segments correspond to fresh water species such as: carp, Asian cyprinids combined, trout farms and other fresh water species. A segment that has lately achieved considerable growth is the new farms of sturgeons, developed with the EFF fund in the last 2 years.

Table 7.2.1: Economic Performance at national level: Bulgaria

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	274	336	22.6
Total sales volume	TONNE	2855	3266	14.4
Turnover	000 EURO	7211	8431	16.9
FTE	NUMBER	1100	1375	25.0
Gross Added Value	000 EURO	-13851	-16454	-18.8
EBIT	000 EURO	-16452	-20122	-22.3
Return on investment	%	-43.0	-77.5	-80.2
Subsidies	000 EURO			
Labour productivity	000 €/FTE	-13	-12	4.9
Capital productivity	%	-36.2	-63.4	-75.0

The value of turnover is influenced by the sales products, due to the fact that the prices are little big higher for domestic market, where the production is sold in its majority. The exports are quite significant with destination to neighbouring countries especially.

The involution of the relevant indicators of the profitability, namely GVA, EBIT and ROI could be explained by the absence of subsidies and the decline of the market due to the economic crisis.

The increased of mean wage, as per the Figure 7.2.1, as well as the employee's number in a difficult market condition determinates the decrease of labour productivity by 5 % in 2009 comparing with 2008.

The increased of mean wage, as per the Figure 7.2.1, as well as the employee's number in a difficult market condition determinates the decrease of labour productivity by 5 % in 2009 comparing with 2008.

Figure 7.2.1: Employment and average annual salary: Bulgaria

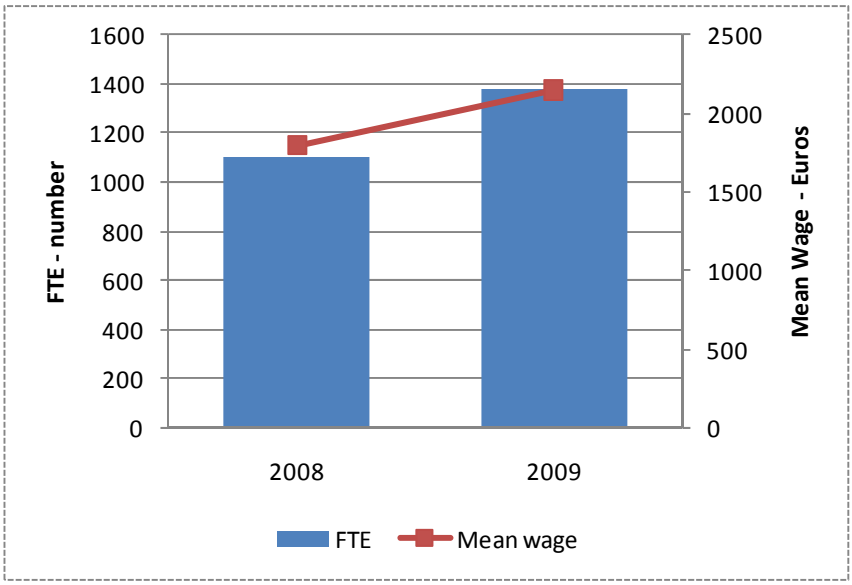
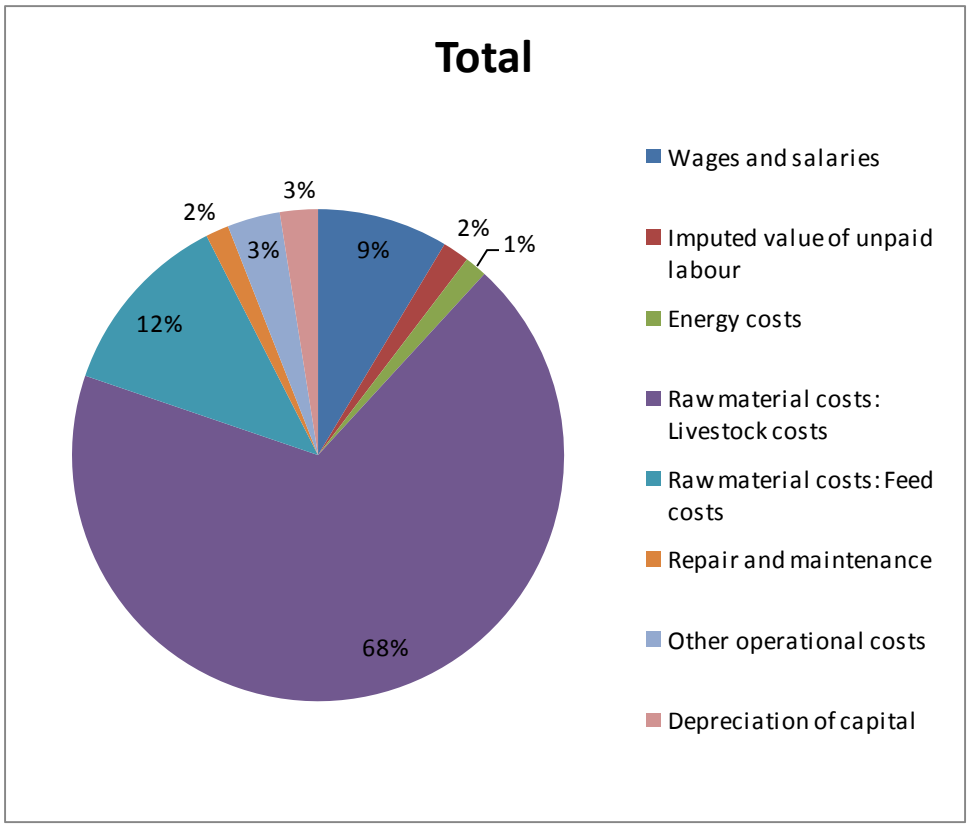


Figure 7.2.2: Operational costs structure: Bulgaria



The analyze of the structure costs for the whole sector Figure 7.2.2, shows the highest share for raw material costs: livestock – 68 % and feed costs – 12 % corresponding to an extensive technology used for base land aquaculture. This could be one of the causes to explain the general inefficiency of the sector.

7.2.2. Trends and triggers

The lack of subsidies and the absence of innovative technology led to a generally inefficiency in the aquaculture sector.

Since 2010, new species are introduced using the support offered by EFF, especially for projects building new farms of sturgeons.

Considering the economic difficulties in the sector, together with the general situation of the national economy, there are no big expectations for improvements in the economic performance of 2010 and 2011.

7.2.3. Data coverage and Data Quality

Despite the basic data availability, data quality and coverage should be improved, in order to assure consistency with other official data sources (Eurostat) on value and volume. Especially by providing detailed data at the segment level.

7.3. CYPRUS

7.3.1. Overview of the sector

In 2009 there were in Cyprus 12 companies with a turnover of almost 20 million Euros and a sales volume of more than 4000 tonnes.

The main segments are:

- Seabass/seabream (open sea cage farming)
- Seabass/seabream (landbased marine hatchery)
- Bluefin tuna (open sea cage farming)

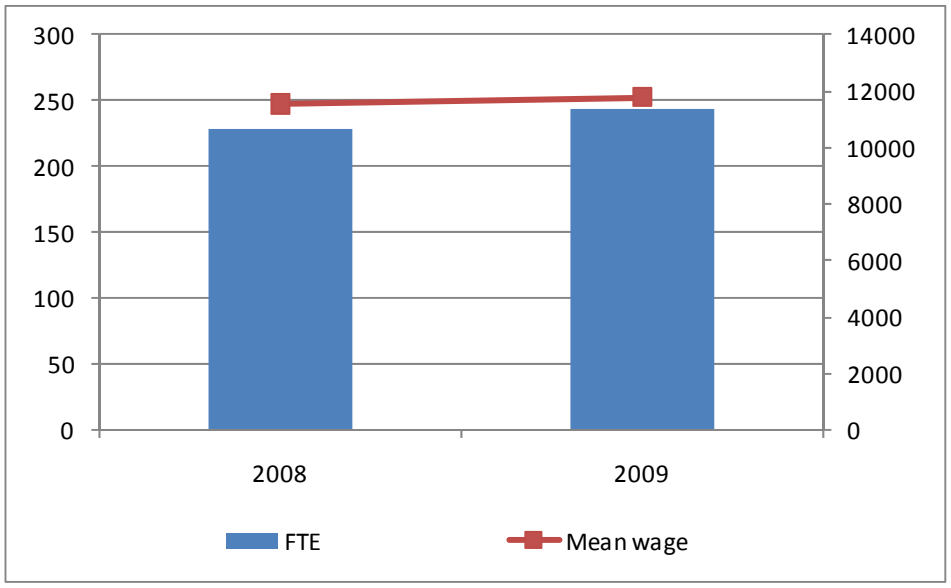
On table 7.3.1, it can be seen the main economic performance indicators at the national level.

Table 7.3.1: Economic Performance at national level: Cyprus

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	9	12	33.3
Total sales volume	TONNE	6920877	4082773	-41.0
Turnover	000 EURO	32099	19831	-38.2
FTE	NUMBER	228	243	6.5
Gross Added Value	000 EURO	14618	7445	-49.1
EBIT	000 EURO	12204	5185	-57.5
Return on investment	%	78	15	-81.3
Subsidies	000 EURO	826	607	-26.5
Labour productivity	000 €/FTE	64	31	-52.2
Capital productivity	%	94	21	-77.6

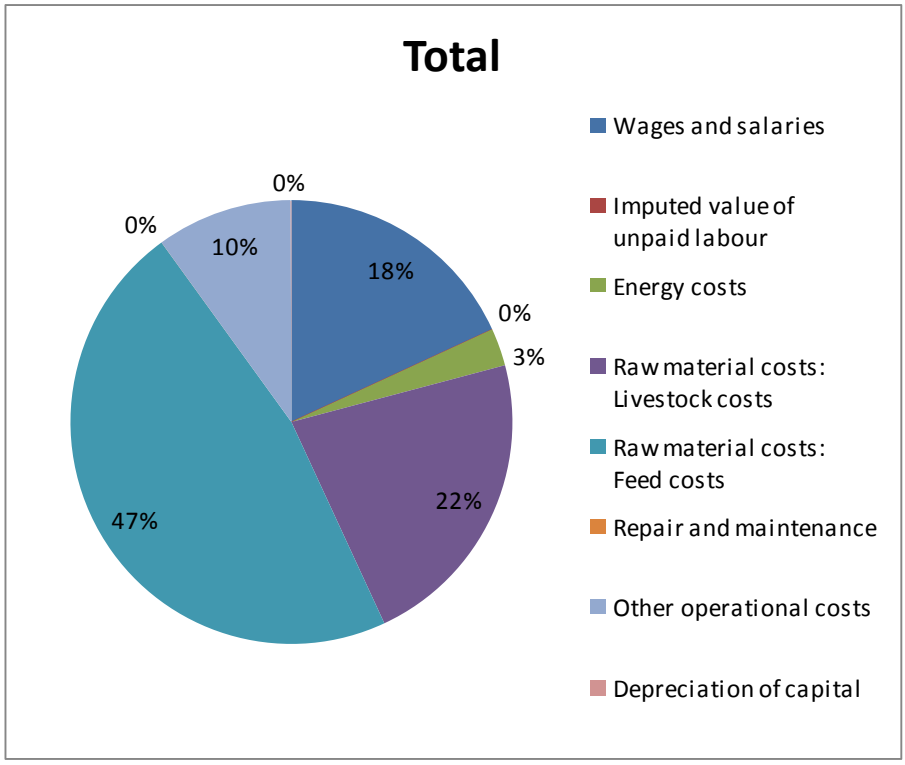
These 12 companies employed 133 employees with a mean wage of 11,768 Euros per year in 2009.

Figure 7.3.1: Employment and average annual salary: Cyprus



The operational cost structure for the aquaculture sector in Cyprus can be seen on figure 7.3.2.

Figure 7.3.2: Operational costs structure: Cyprus



From figure 7.3.2, it can be seen that the main operational are the feed costs (47%), livestock costs (22%) and wages and salaries (18%).

7.3.2. Trends and triggers

Very recently emphasis has been given in the culture of meagre (Argyrosomus regius).

During this year, total production is expected to rise substantially due to the opening of new markets and the growth of existing ones.

7.3.3. Data coverage and Data Quality

7.4. DENMARK

7.4.1. Overview of the sector

In 2009, the total population of aquaculture farms in Denmark was 272. The farms were distributed on 160 enterprises. The number of persons employed was 532, corresponding to a total number of 360 FTEs. Only 12 % of the full time employees in the sector were women. The total volume of sales from the aquaculture sector was 45,900 tons, corresponding to a total turnover of 135 million Euro.

The main species produced in Denmark is rainbow trout, which makes up for 90 % of the total volume of production. The small portion size trout is typically produced in land based farms, located in the western part of Denmark (Jutland). The techniques used for production on the farms are primarily ponds, tanks, raceways and recirculation systems. The larger size trout and trout eggs are produced in sea cage farms. Denmark also has a minor production of European eel in land based recirculating farms and blue mussel produced on long lines.

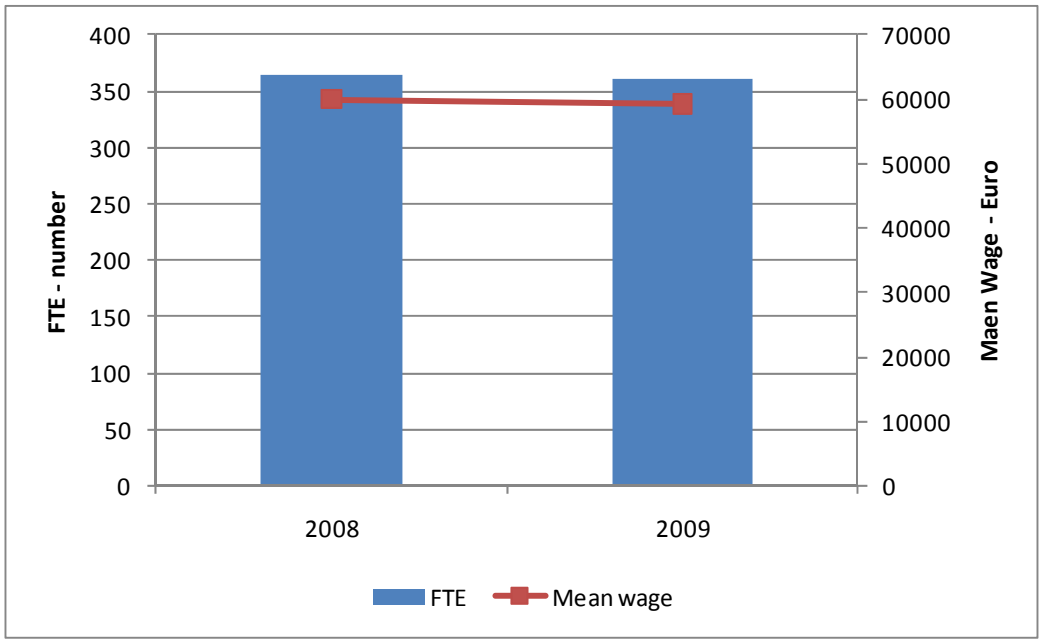
Table 7.4.1: Economic Performance at national level: Denmark

variable	unit	2008	2009	%Change
Number of enterprises	NUMBER	162	160	-1.2
Total sales volume	TONNE	45324	45877	1.2
Turnover	000 EURO	130028	134971	3.8
FTE	NUMBER	365	360	-1.4
Gross Added Value	000 EURO	30575	28007	-8.4
EBIT	000 EURO	2189	-1206	-155.1
Return on investment	%	1.1	-0.6	-156.6
Subsidies	000 EURO			
Labour productivity	000 €/FTE	83.8	77.8	-7.1
Capital productivity	%	15.8	14.9	-5.6

The number of farms, enterprises and employees has been decreasing over the past decade. Between 2008 and 2009 the number of farms decreased from 162 to 160, whereas the number of FTE decreased from 365 to 360.

The sales volume and turnover increased slightly by 1.2 % and 3.8 %, respectively. On the other hand, the earnings before interest and tax (EBIT) and the return on investment (ROI) decreased significantly. This decrease should be seen in context with the changes in the gross value added (GVA). The GVA decreased by 8.4 % due to a significant increase in the raw material costs for livestock. The purchase of livestock grew more than 40 % from 2008 to 2009. The increased cost can be explained by the larger amount of livestock purchased, rather than price changes. The farmers had a relative low livestock in 2008, compared to the years before, and are, furthermore, investing in new livestock for future harvesting. The decrease in GVA affect the labor and capital productivity negatively, in 2009.

Figure 7.4.1: Employment and average annual salary: Denmark



7.4.2. Structure and economic performance of the sector's main segments

In Denmark, the aquaculture production is divided into four segments based on the species produced and the technique used. The main species produced in Denmark is rainbow trout. The sales volume was 41,500 tons with a corresponding turnover of 120 million Euro, in 2009. The trout production is divided into two segments based on technique and production environment: Land based trout farms (seg2.3). The techniques used in the land based farms are ponds, raceways and recirculation system, which mainly produce small portion size trout. The segment consists of 126 enterprises running 214 farms and the production volume accounts for 75 % of the total trout production. The production volume was 31,200 tons with a corresponding turnover of 79 million Euro. Sea cage trout farms (seg2.4) covers the last 25 % of the trout production, where the main product, besides the fish meat, is trout eggs. The sales volume was 10,300 tons bringing about a turnover of 41 million Euro. In 2009 there were 20 farms distributed among 6 enterprises.

Denmark also has a minor production of European eel in land based recirculating farms (seg5.3). The segment consists of 9 enterprises representing one farm each. The production technique in this segment is very intensive recirculating more than 95 % of the water. The eel production enterprises are depending on wild caught glass eel for production. The production volume was 1,400 tons with a corresponding turnover of 11.3 million Euro, in 2009. The last segment is blue mussels on long lines (seg7.2), which has emerged in recent years. The production was 2,500 tons with a corresponding turnover of 1.7 million Euro, in 2009. The segment had 15 enterprises representing 21 farms. The farms are almost all located in Limfjorden in the northern part of Jutland.

Table 7.4.2: Main segments and economic indicators: Denmark

Techniques		combined	cages	combined	Long-line
Species		trout	trout	Eel	Blue mussel
Environment		Freshwater	Saltwater	Freshwater	Saltwater
Number of enterprises	NUMBER	126	6	9	15
Total sales volume	TONNE	31191	10282	1376	2534
Turnover	000 EURO	79190	41253	11324	1682
Gross Added Value	000 EURO	20686	3761	2759	
EBIT	000 EURO	-354	-352	497	
Return on investment	%	-0.3	-1.0	2.6	
FTE	NUMBER	240	64	30	18
Subsidies	000 EURO				
Labour productivity	000 €/FTE	86.2	58.8	92.0	
Capital productivity	%	16.3	10.9	14.3	
Running cost to turnover ratio	%	97.8	101.6	92.3	113.7
EBIT to turnover ratio	%	-0.5	-0.9	4.4	

In Table 7.4.2, the economic indicators for the four Danish segments are presented. From the table it can be seen that the only segment that provides a positive EBIT is the eel producers, in 2009. One of the reasons for the negative result in the trout producing segments are the investment in the raw material livestock, which increased more than 40 % from 2008 to 2009. These segments are expected to increase profitability in the coming years when the livestock is harvested. This will also bring down the running cost to turnover ratio, which is close to or above 100, in 2009.

The blue mussel farms is a relative new and small segment both in terms of volume and value in the Danish aquaculture sector. The segment is struggling to increase production and productivity, but so far the conditions and competition in this sector has not been favorable to the Danish producers. The blue mussel farmers have been represented in The Danish Account Statistics for Aquaculture since 2006, but so far without a positive economic result.

In Figure 7.4.2 to Figure 7.4.5, the operational cost structure for the four segments are presented.

The trout and eel segments have the traditional cost composition for a finfish aquaculture industry, where the main cost components are feed and livestock. In the three segments the two items accounts for 49-64 % of total costs. In the inland trout farms the feed is the most important cost item, where the livestock cost is more important in sea cage farming. The fish (smolt) bought for sea cage is larger than for in land farming, which explains the different cost compositions. The eel farmers have the most intensive farms and use twice as much energy as the inland trout farms. The energy is used to recirculate and heat the water in the farms.

Figure 7.4.2: Operational costs structure for trout combined: Denmark

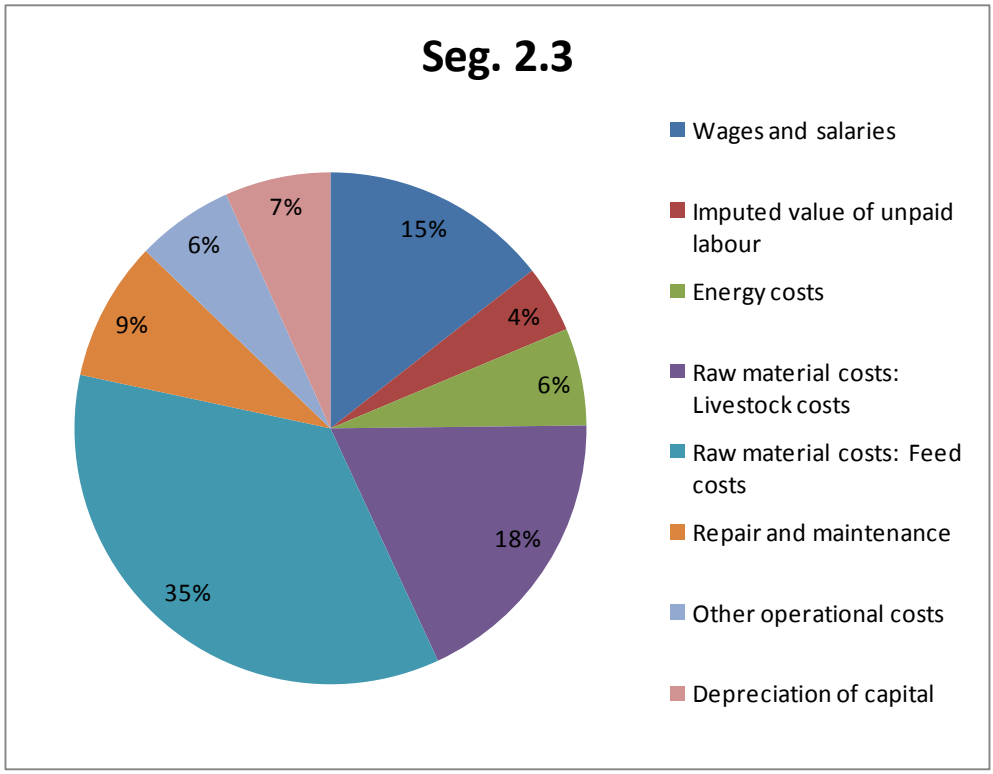


Figure 7.4.3: Operational costs structure for trout in cages: Denmark

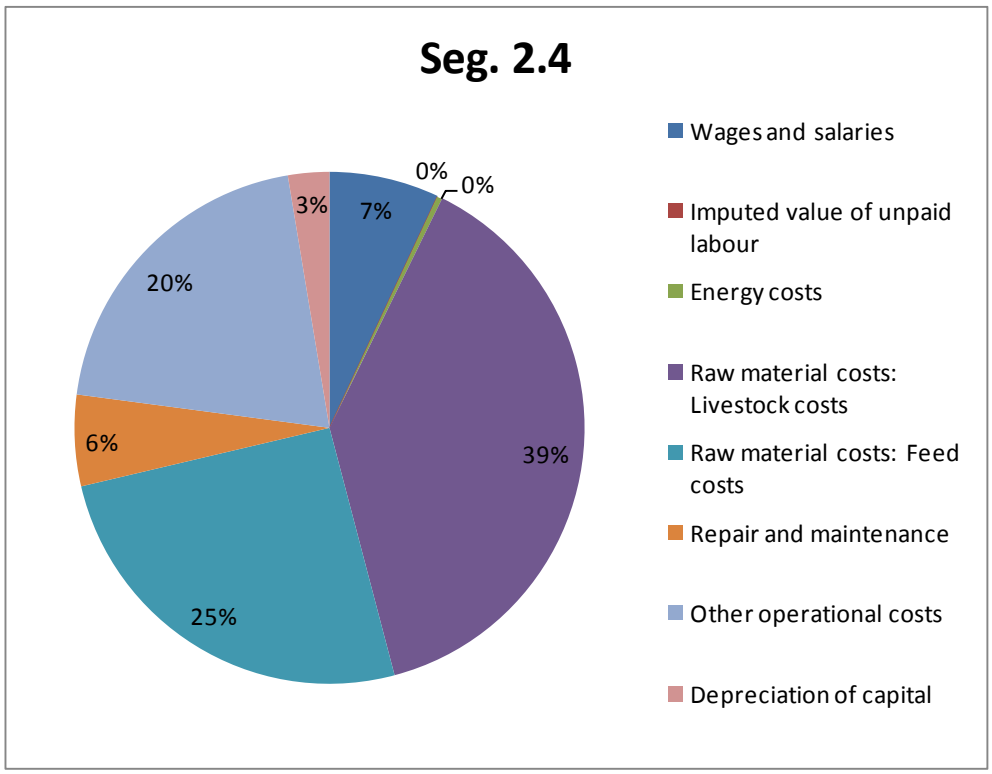


Figure 7.4.4: Operational costs structure for eel combined: Denmark

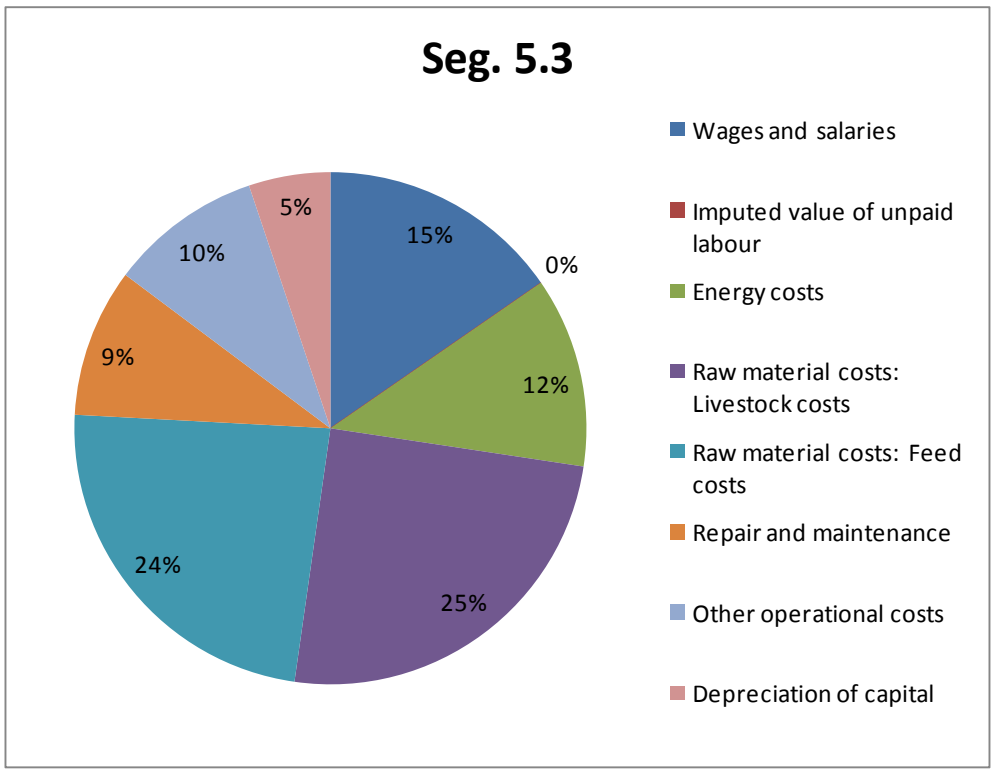
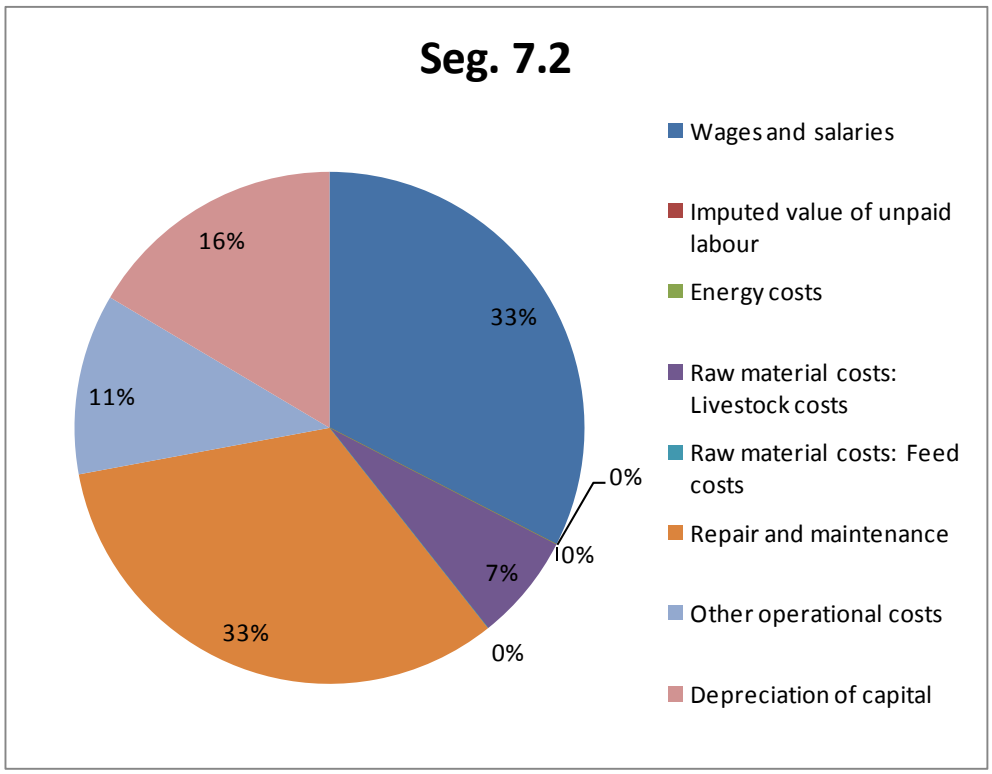


Figure 7.4.5: Operational costs structure for mussels in long-lines: Denmark



7.4.3. Trends and triggers

Specific interesting topics at the national level

Growth in aquaculture has been on the political agenda for a long time in Denmark, the EU and OECD, as a possible solution for increasing the fishing industry raw material basis and creating growth and jobs, both in the primary industry and the follow industries. However, over the last 20 years the growth in Denmark, the EU and most OECD countries has stagnated.

Growth in the aquaculture sector is desirable, because the demand for fish is increasing; the capture fisheries have stagnated and the dependency on imported fish is growing inside the EU. Inside the European Union (EU), attempts have been made to increase aquaculture production in a sustainable way (European Commission 2002, 2009)[1], but so far without success. The failed

[1] European Commission, 2002. Communication from the Commission on a Strategy for the Sustainable Development of European Aquaculture – EUR. COM(2002) 511.

attempts to achieve sustainable growth under the existing regulatory regime based on command and control have increased the need to analyze alternative regulation and management policies of the aquaculture sector if the aim of sustainable growth is to be reached.

Currently, the Danish aquaculture sector is regulated by farm specific feed quotas. Feed is the most important input and accounts for more than 40% of the costs. In a specialized aquaculture production, there are only limited or zero substitution possibilities for feed. The use of feed is, therefore, closely linked to the possible production, and thereby to the pollution discharged from the farm. The existing regulation secures that the overall level of nitrogen pollution is not exceeded. However, a new technology introduced in Denmark can reduce nitrogen pollution by 30-50% per kilo of produced fish. Reducing the level of nitrogen is expected to also reduce the levels of other externalities, such as phosphorus and organic material. This technical solution may offer the possibility of realizing growth without increasing existing levels of pollution. Results in Nielsen (2011)[2] suggest that the shift to new environmentally friendly technology has no significant impact on farm efficiency. However, the new technology will only be implemented if farmers have an incentive to do so, which is not present under the existing regulation.

A new regulation based on individual transferable quotas on nitrogen has been recommended by the Danish Government Aquaculture Committee in 2010, with the aim of increasing production without increasing the existing level of pollution. The ambition is to increase Danish fresh water aquaculture production from about 30,000 to 60,000 tons and aquaculture production in general from 45,000 to 115,000 tons from 2007 to 2013.

European Commission, 2009. Communication from the Commission to the European Parliament and Council. Building a sustainable future for aquaculture. A new impetus for the Strategy for the Sustainable Development of European Aquaculture. COM(2009) 162 final.

[2] Nielsen, R., 2011. Green and Technical Efficient Growth in Danish Fresh Water Aquaculture. Aquaculture Economics & Management.

Nielsen, R., 2011. Introducing Individual Transferable Quotas on Nitrogen in Danish Fresh Water Aquaculture: Production and Profitability Gains.

Under the existing regulation, the farmer's main focus is to optimize production based on the feed quota, whilst he has no incentive to reduce the pollution discharged from the farm, because there is no feedback between this, and production and profit. A regulatory change to individual pollution rights on nitrogen can ensure that the most efficient farmers will be the ones who produce. This can potentially increase production and profit, without increasing pollution. Furthermore, it would provide the farmers with an incentive to reduce pollution in order to increase production and profitability, which would lead to further development and the adoption of new environmentally friendly production methods and technologies. It is important to identify the possible gains and losses of regulatory changes, as in this paper, because if a regulation is not optimal, it can lead to welfare losses for the society and individual producers.

Issues of special interest

In Denmark, a few farms are experimenting on the production of new species and using new technology. So far, the most successful project is the production of Pike Perch in recirculating systems. Furthermore, a new large inland recirculation production system has been set up for the production of Atlantic salmon. In an inland farm the control of the production process is much higher than in a sea cage farm and there is a much better opportunity to control the pollution of nitrogen, phosphorus and organic material etc.

Outlook for 2010 and 2011

For the Danish trout producers 2010 and 2011 are expected to be better than 2009, especially for the sea cage farmers. The reason is that the salmon price has been high, because of the salmon crises in Chile. The salmon price affects prices on large trout, because they are substitutes for salmon, and the prices have been increasing until the middle of 2011. The volume and turnover is, therefore, expected to increase for the trout producing segments. The eel farmers are expected to decrease production due to the restriction on the harvesting of glass eels. Furthermore, this restriction drives up prices on glass eels making it less profitable to produce eel. The mussel farmers are expected to increase production and turnover, but it is still questionable if the profit will be positive.

7.4.4. Data coverage and Data Quality

Data quality

The account statistic for 2009 is based on a sample of 153 aquaculture farms, which covers 56 % of the total population of 272 farms. The sample covers 76 % of the total sales value of the population. Furthermore, data on sales volume and value, purchase of livestock raw material of fish are available for all farms.

The Danish Directorate of Fisheries has registered the total population of farms and enterprises engaged in aquaculture production in Denmark. It is mandatory for all aquaculture producers in Denmark to report the production in volume and value each year at the farm level. Furthermore, the species produced and the technique used in the production is reported.

The data for The Danish Account Statistics for Aquaculture is collected by Statistics Denmark. The collection is based on the total population of farms provided by The Danish Directorate of Fisheries. The data is collected on farm level, and can be aggregated to the enterprise level. The data is collected on farm level to get the most homogenies segments in terms of species and technique. The Danish Account Statistics for Aquaculture collects economic data for costs and earnings and balance sheets. Data is collected on a voluntary basis from the owner's chartered accountant. The accountant's task is to report the accounts of his aquaculture clients to Statistics Denmark in a special form where the account information is harmonized for statistical use. Statistics Denmark validates the data from each account in a specially designed data system for quality control. The Danish Commerce and Companies Agency (DCCA) also collect account data for enterprises, but not for single holders. For enterprises which are not reported by the chartered accountant, the accounts from DCCA are used.

The extrapolation of the sample to the total population is done in two steps. In the first step all results from the collected accounts are entered into a database containing information on all existing aquaculture producers in Denmark. From the collected accounts an average is calculated for all indicators in each segment. In the second step, an account for the remaining population are estimated based on the average calculated in the first step and the information collected by the Danish Directorate of Fisheries. The underlying assumptions for this calculation are that the

production function for each farm is identical within each segment. When the production function is identical, the costs and earnings can be distributed from the sales volume and value in each account.

Data availability

Data for the aquaculture sector is published once a year on both an aggregated farm and enterprise level for each segment. The aquaculture statistics are published on Statistics Denmark's website approximately 12 months after the end of the reference year.

Confidentiality

The 4 segments that are surveyed in Denmark are presented in Table 7.4.2. To avoid problems with confidentiality, segments should in general include more than 10 enterprises. In Denmark, both the production of the sea cages farms and the production of eel in recirculation systems are quite significant in terms of value, and even though these two segments include less than 10 companies, they are surveyed. In order to present detailed data collected from these two segments, nearly all enterprises have agreed to participate in the survey.

Input of expert about the segmentation on enterprise level, the homogeneity of the segments in terms of techniques and species.

All segments provided by Statistics Denmark have a high degree of homogeneity both concerning the species and technique. The separation of species into segments is 100%, but if an enterprise produces more than one species, then it is allocated to the segment of the species that contributes the most to the turnover.

Some enterprises own more than one farm using different techniques. In Denmark these activities are split up, because the farm is used as data collection unit. When farms are aggregated into enterprises again, the enterprise is allocated to the segment, where its turnover is highest. There are only very few examples of enterprises using more than one technique.

Differences with other official data sources (Eurostat)

There are some differences in the volume and value collected by the Danish Directorate of Fisheries and Statistics Denmark. In general, both volume and value are higher in the Aquaculture Account Statistics. The reason for this is that the value and volume in the Account Statistics are measured in enterprise sales, while the numbers from the Danish Directorate of Fisheries are measured as farm production. Secondly the data collected by Statistics Denmark are account data and the account year is not necessarily coinciding with the calendar year.

7.5. ESTONIA

7.5.1. Overview of the sector

Estonian aquaculture sector is very small. There are around 20 commercial companies in Estonia whose main important activity is fish farming. The main product is rainbow trout forming around 80 % from the total production. The share of the second important fish – common carp, is already only around 7 %. There is only one fish farm growing eel in Estonia, which production was about 30 tonnes in 2009. Salmon is rearing for restocking only by one fish farm, which is state-owned and has no commercial purpose. Additionally, few enterprises provide very limited production of other fresh water species mainly for stocking (sea trout, pike, pikeperch, whitefish, tench).

Due to the small number of enterprises it is reasonable to collect data only concerning rainbow trout, concerning other species the value of production is too small to justify any sampling activities, also, confidentiality problems may arise. Even concerning rainbow trout the total number of enterprises is only 11. The total sales volume of these 11 enterprises was 421 tonnes fish having turnover around 1 million Euros in 2009. The number of total employees was 33.

Table 7.5.1: Economic Performance at national level: Estonia

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	11	11	0.0
Total sales volume	TONNE	334	421	26.0
Turnover	000 EURO	826	1048	26.9
FTE	NUMBER	24	20	-16.7
Gross Added Value	000 EURO	458	422	-7.9
EBIT	000 EURO	74	150	101.8
Return on investment	%	1.9	3.7	95.8
Subsidies	000 EURO	56	123	120.5
Labour productivity	000 €/FTE	19.1	21.1	10.5
Capital productivity	%	11.7	10.4	-10.6

Economic performance and productivity indicators in 2008 and 2009 are presented in the Table 7.5.1. There were no changes in the number of enterprises between 2008 and 2009. The turnover of rainbow trout production and sales volume increased approximately 27 % and 26 % respectively. The number of FTE (full time employment) in the rainbow trout farming sector in 2008 was 24. In 2009 the same number was 20, decreasing was 17 %. At the same time average salary per employee (FTE) increased 2 % and reached to 13,980 Euros in 2009, see the Figure 7.5.1.

The amount of gross added value (GVA) generated by the rainbow trout farming enterprises in 2009 was 0.4 million Euros, it was 7.9 % lower than in previous year. The earnings before interest and tax (EBIT), the return of investments (ROI) and the labour productivity (LAP) increased 101.8 %, 95.8 % and 10.5 % respectively. The sector was supported by investment subsidies which amount was around 0.12 million Euros in 2009. It was twice as high as in 2008.

Figure 7.5.1: Employment and average salary: Estonia

7.5.2. Structure and economic performance of the sector's main segments

Enterprises farming rainbow trout in Estonia can be divided into two segments based on fish farming techniques:

- Trout on growing;
- Trout combined (including trout on growing and trout hatcheries & nurseries).

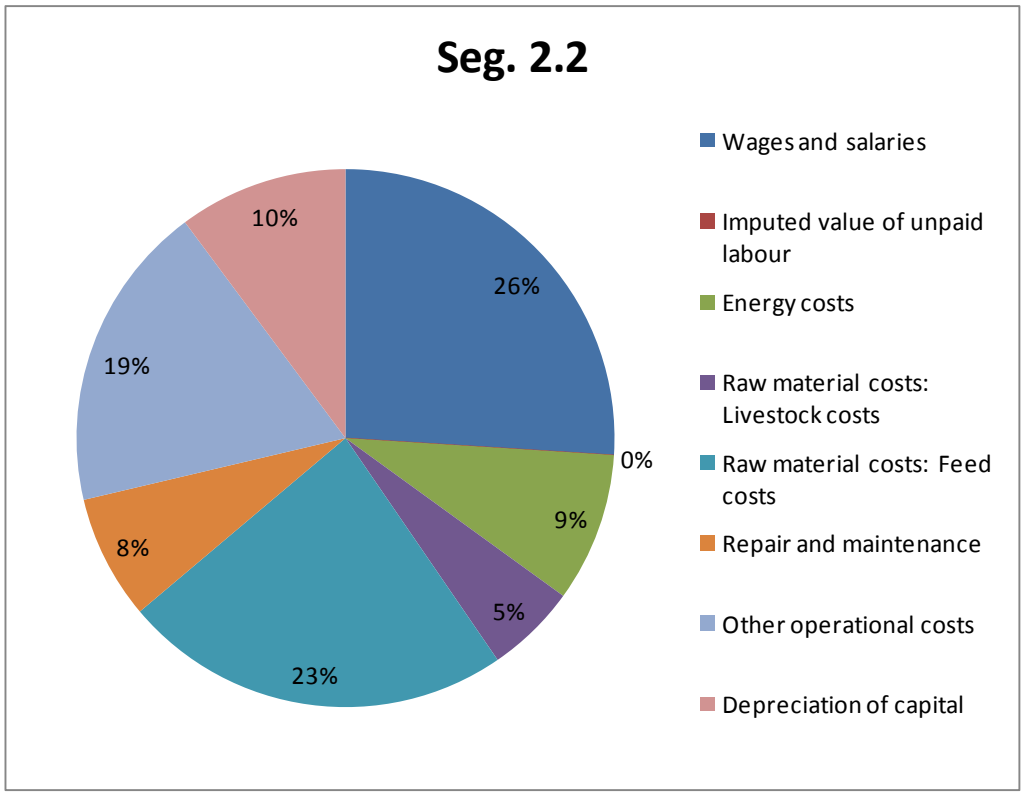
Based on the number of the enterprises the main segment was trout on growing. Economic performance and productivity indicators for main segment in 2009 are presented in the Table 7.5.2. The total number of enterprises dealing with trout on growing was 8. The total sales volume of these 8 enterprises was 155 tonnes fish having turnover around 0.5 million Euros in 2009. The amount of gross added value (GVA) they generated was around 0.23 million Euros. The number of FTE was 15.

Table 7.5.2: Main segment and economic indicators: Estonia

Techniques		On growing
Species		Trout
Environment		Freshwater
Number of enterprises	NUMBER	8
Total sales volume	TONNE	155
Turnover	000 EURO	476
Gross Added Value	000 EURO	234
Return on investment	%	2
EBIT	000 EURO	52.8
FTE	NUMBER	15.0
Subsidies	000 EURO	120
Labour productivity	000 €/FTE	15.6
Capital productivity	%	9.3
Running cost to turnover ratio	%	157.0
EBIT to turnover ratio	%	11.1

The total amount of production costs by the trout on growing segment in 2009 was 0.83 million Euros. The two largest cost items were formed by labour costs (26 %) and feed costs (23 %), see the Figure 7.5.2.

Figure 7.5.2: Operational costs structure of trout on growing: Estonia



7.5.3. Trends and triggers

Due to its small size, the aquaculture sector has little influence on the national economy in Estonia. Wholesale and processing companies are not interested in the domestic production due to small production and unstable supply of aquaculture products. Aquaculture has a little more influence on the economy through tourism, because they supply put-and-take ponds which are an attractive part of leisure time activities in many holiday houses.

Despite the difficulties fish farmers have started to modernise fishing farms to increase production. Also they have realised that the adding value through processing and increasing the quality of products (filleting, salting, marinating, smoking) can help to broaden the market and

raise profitability. Some enterprises have expressed an interest in the cultivation of new fish species which may expand marketing possibilities. Based on preliminary data the rise in total production volume is expected in aquaculture sector in 2010 and 2011.

7.5.4. Data coverage and Data Quality

Due to the small number of commercial fish farming companies it was reasonable to collect data only concerning rainbow trout, concerning other species the value of production was too small to justify any sampling activities. There was also a threat to confidentiality. That is a reason why DCF and EUROSTAT data may be different. The data were collected trough the questionnaires by Estonian Marine Institute and then compared with the data in the financial statements.

7.6. FINLAND

7.6.1. Overview of the sector

There were 259 aquaculture companies in operation in 2009 and the aquaculture sector employed 347 FTEs. The total turnover of aquaculture companies in 2009 was 57 million Euros and the total volume of aquaculture production was 13,314 tons. The main aquaculture segments in Finland are combined production of juveniles and food fish, marine aquaculture (cages), hatcheries and nurseries and food fish production inland (on growing). The combined segment includes natural food ponds. The food fish supply has been mainly consisting of rainbow trout but during the past years also European whitefish production has increased. The production of fry in fish farms consists mainly of rainbow trout fry for food fish farming. Fish farms also produce Baltic salmon, landlocked salmon, brown trout, sea trout, char and brook trout fry.

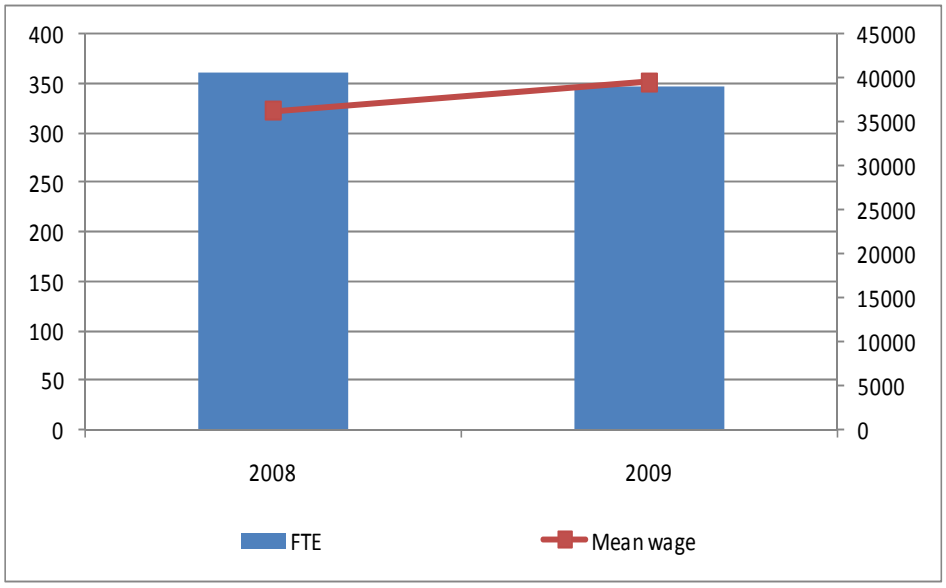
Table 7.6.1: Economic Performance at national level: Finland

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	262	259	-1.1
Total sales volume	TONNE	13585	13314	-2.0
Turnover	000 EURO	65784	57383	-12.8
FTE	NUMBER	361.0	347.0	-3.9
Gross Added Value	000 EURO	20892	20935	0.2
EBIT to turnover ratio	%	8	8	4.1
Return on investment	%	5.9	5.6	-5.7
Subsidies	000 EURO			
Labour productivity	000 €/FTE	57.9	60.3	4.3
Capital productivity	%	24.8	25.7	4.0

The turnover of aquaculture sector decreased in 2009 resulting in 57 million Euros. There was a decrease of 13 % compared to the previous year. Also the total sales volume of aquaculture products decreased by 2 % in 2009 compared to the previous year. In 2009, the total sales volume was 13,314 tons as in 2008 it was 13,585 tons. The profitability of the sector decreased slightly.

The gross value added of the aquaculture sector was 20.9 million Euros in 2009. The GVA remained almost unchanged from the previous year. However, the earnings before interests and taxes decreased by 9 % being 4.5 million Euros. Also the return on investment decreased slightly. In 2009 the return on investment was 5.6 % as it was 5.9 % in 2008. Labour productivity of Finnish aquaculture increased to 60,332 €/FTE in 2009. Also the capital productivity increased being 26 %.

Figure 7.6.1: Employment and average annual salary: Finland



There was 4 % decrease in the employment to 347 FTE in 2009. At the same time, the average salary increased by 9 %. The average annual salary in 2009 was 39,521 €/FTE.

7.6.2. Structure and economic performance of the sector's main segments

Finnish aquaculture consists of food fish production and the production of juveniles. Food fish is produced mostly on saltwater farms (cages) but also in the inland. The four main aquaculture segments in Finland are combined production of juveniles and food fish (including natural food ponds), marine aquaculture (cages), hatcheries and nurseries and food fish production inland (on growing). Inland food fish production is mainly done in raceways but also in cages in lakes. In the DCF segmentation these are considered as on growing farms. Some of the food fish firms have integrated fry production but there are also specialized juvenile fish producers. There are two main production methods in juvenile production: tanks and natural food ponds. The combined segment includes also those natural food ponds. Most of the natural food pond production is considered small scale and is a subsidiary business, mainly in agriculture. Only commercial natural food pond production is considered.

Most marine farms are specialized in rainbow trout production, some produce also European whitefish. The production of fry in fish farms consists mainly of rainbow trout fry for food fish farming. Fish farms also produce Baltic salmon, landlocked salmon, brown trout, sea trout, char and brook trout fry. Approximately 80 % of the salmon and trout fry production was supplied for stocking purposes. The combined fish farms and natural food ponds produces mainly whitefish fry. The fry reared on fish farms were mainly supplied for further rearing as food fish, whereas those reared in natural food ponds went mainly for stocking. The next largest productions in natural food ponds after whitefish were pike perch and grayling, almost exclusively supplied for stocking purposes. Small amounts of pike, Cyprinids and crayfish fry were also produced.

Table 7.6.2: Main segments and economic indicators: Finland

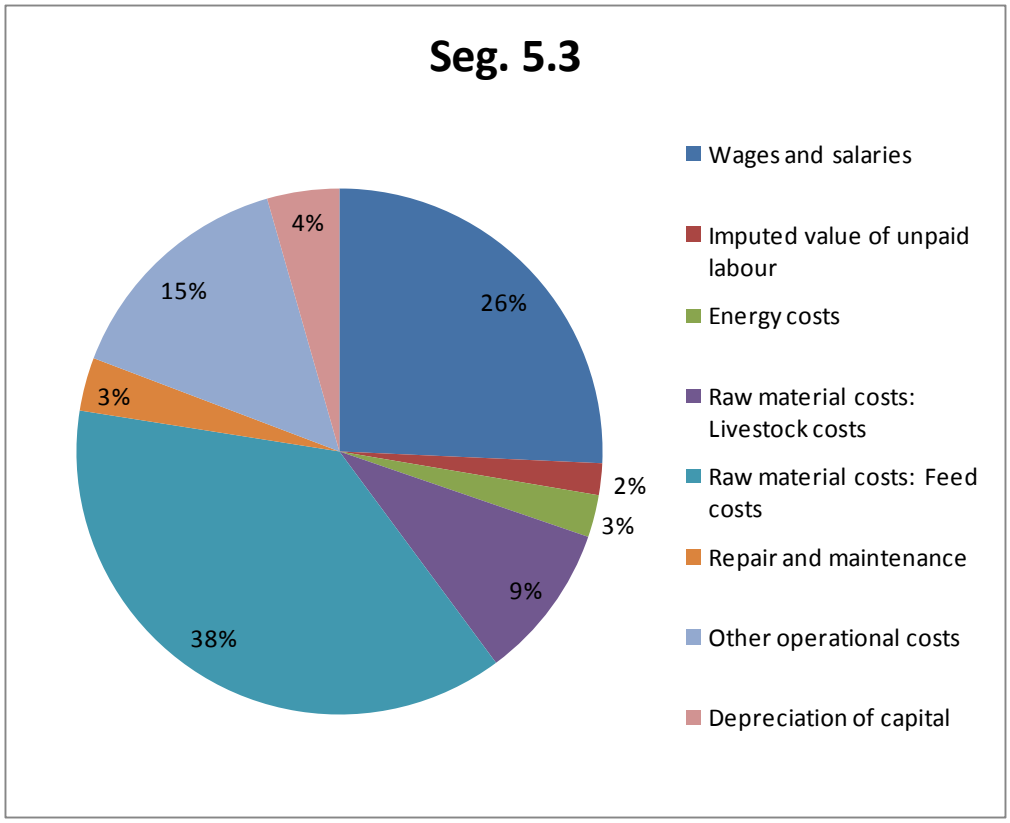
Techniques		Hatcheries and nurseries	On growing	Combined	Cages
Species		Other fresh water fish*	Other fresh water fish*	Other fresh water fish*	Other fresh water fish*
Environment		Freshwater	Freshwater	Freshwater	Saltwater
Number of enterprises	NUMBER	20	18	189	32
Total sales volume	TONNE	3027	1862	92	8333
Turnover	000 EURO	6824	2221	39486	8852
Gross Added Value	000 EURO	2437	781	15603	2114
EBIT	000 EURO	397	-105	3891	354
Return on investment	%	4.7	-1.6	7.2	2.9
FTE	NUMBER	51.0	24.0	232.0	40.0
Subsidies	000 EURO				
Labour productivity	000 €/FTE	47.8	32.5	67.3	52.8
Capital productivity	%	28.5	12.2	28.8	17.3
Running cost to turnover ratio	%	92.4	94.9	88.3	91.0
EBIT to turnover ratio	%	5.8	-4.7	9.9	4.0

* Includes also rainbow trout and salmon

Segment 5.3: Combined production of juveniles and food fish (including natural food ponds)

The most important segment in Finland in terms of turnover and number of companies was combined production of food fish and juveniles with turnover of 39.5 million Euros. The total volume of sales for these companies was 92 tons and there were 189 companies operating in the segment with 232 FTEs. The gross value added of combined production companies was 15.6 million Euros and the labour productivity was highest of all segments with 67,256 €/FTE. Also the return on investment was high, 7.2 %. The running costs to turnover were lowest of these main segments, only 88 %.

Figure 7.6.2: Operational costs structure of combined production of juveniles and food fish: Finland

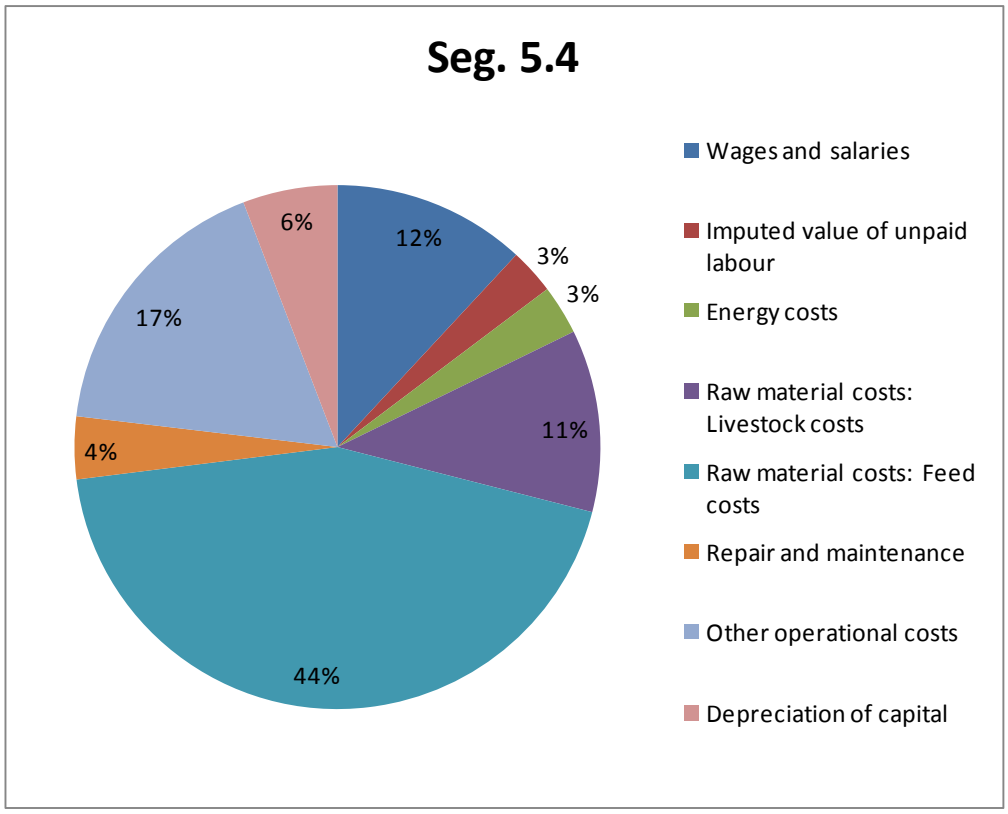


38 % of the operational costs were feed costs in the companies specialized in combined production of juveniles and food fish in 2009. Wages and salaries accounted for 26 % and other operational costs 15 % of the operational costs.

Segment 5.4: Marine aquaculture (cages)

The second biggest segment in terms of turnover was cages in saltwater. They produce mainly rainbow trout and European whitefish for food fish. The total volume of sales for these marine cages was 8,333 tons and there were 32 companies operating in the segment with 40 FTEs. The labour productivity of fish farms using cages was good: 52,840 €/FTE. However the return on investment was low only 2.9 %. Also the capital productivity (GVA/capital value) was low 17 %.

Figure 7.6.3: Operational costs structure of marine aquaculture in cages: Finland

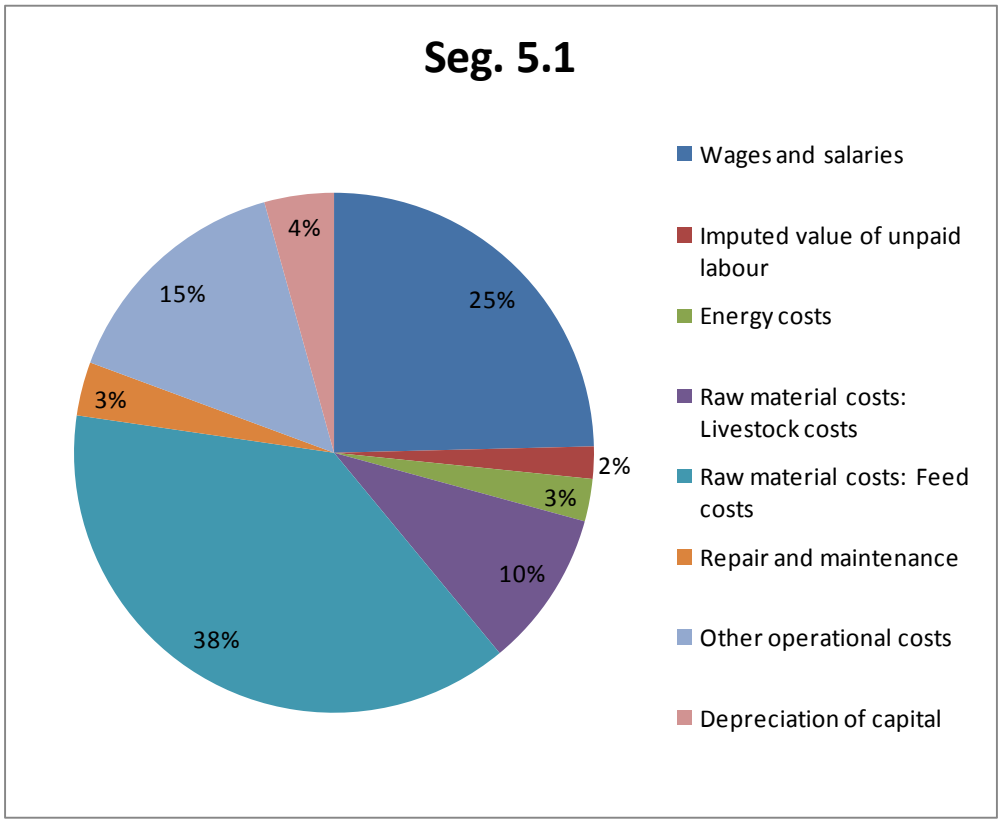


More than half of the operational costs of companies in the segment of marine aquaculture in cages came from raw material costs. Feed costs were 44 % and livestock costs 11 % of the total. Other operational costs accounted for 17 % and wages and salaries only 12 % of the operational costs.

Segment 5.1: Hatcheries and nurseries

There were 20 companies in operation and 51 FTEs employed in hatcheries and nurseries in 2009. The total sales volume of these companies was 3,027 tons and the turnover was 6.8 million Euros. The gross value added was 2.4 million Euros. The capital productivity of hatcheries and nurseries was 28 %.

Figure 7.6.4: Operational costs structure of hatcheries and nurseries: Finland

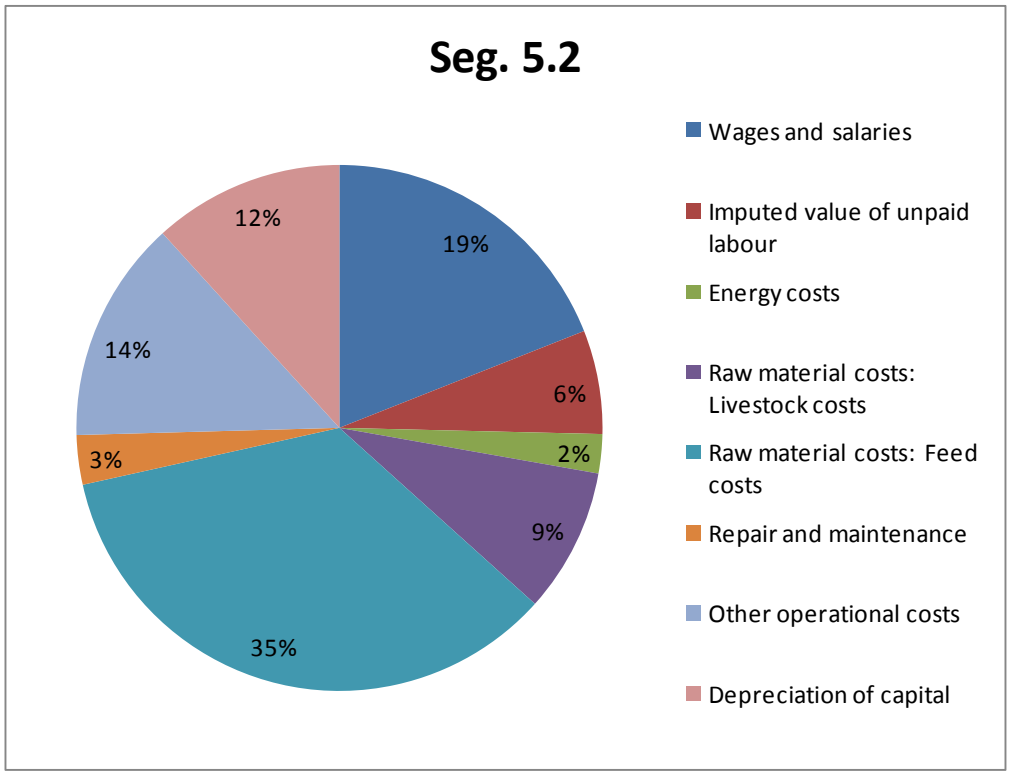


The largest cost item of hatcheries and nurseries companies were the raw material costs and especially the feed costs in 2009. Feed costs accounted for 38 % of the total operational costs. Wages and salaries made up 25 % of all operational costs. Other operational costs and livestock costs were 15 % and 10 % respectively.

Segment 5.2: Food fish production inland (on growing)

The smallest segment in Finland was the inland food fish production (on growing) with turnover of 2.2 million Euros and total sales of 1,862 tons. There were 18 companies in this segment. This segment was also the least profitable one as earnings before interest and taxes was -104,902 €. As a result, the return of investments was negative. In addition the running costs to turnover were very high, 95 % and the capital productivity low, only 12 %.

Figure 7.6.5: Operational costs structure food fish production (inland): Finland



The feed costs were the biggest cost item with 35 % of the total operational costs in the segment of inland food fish production. Wages and salaries made up 19 % and other operational costs 14 % of the total operational costs. Depreciation of capital was also significant cost item with 12 % share of the total.

7.6.3. Trends and triggers

The amount of food fish cultivated in Finland in 2010 decreased of about 1.8 million kilograms over 2009, although the value of food fish production decreased only slightly (0.4 million Euros). According to a study on economic performance of fisheries and aquaculture sector in Finland surveyed in the beginning of 2011, the economic situation of aquaculture companies improved in 2010. The expectations of the aquaculture farmers for the economic performance in 2011 were positive.

Production in the aquaculture sector is based on environmental permission that regulates the maximum amount of feed to be used annually. The environmental regulation of the sector has been tight and has limited the growth and development of production in this sector. The permission system has led to a situation where the average size of production units is small and hence the sector is restricted in gaining economies of scale. This has led to a consolidation of the sector by takeovers. The largest companies have bought a number of smaller producers to receive production licenses to utilize economies of scale. There have also been other attempts to alleviate the environmental effects of aquaculture and to increase the efficiency of the production. Apart from feed development, there has been research on technical alternatives for production and on location guidance for production.

The Ministry of Agriculture and Forestry, in co-operation with the Ministry of the Environment, compiled a National Aquaculture Development Program 2015. The aim of the program is to create preconditions for sustainable growth of the fish farming industry. To achieve this goal, the industry and the environmental policies must be coordinated in a way that these policies form a coherent entity. The industry should be developed to be more environment-friendly, but in an economic and socially sustainable way. According to the program, aquaculture production should be concentrated to water areas, which are environmentally suitable for fish farming. In these areas, production may be increased according to environmental tolerance. New units should be established to open sea areas or other water areas, which, from the environmental point of view, are especially suitable for aquaculture. In these areas, production units may be many times bigger than the present units. The fish farmers' actions to remove nutrients or decrease nutrients outside the Baltic Sea are taken into account in the process of license consideration. Fishing of under-utilized fish species and the use of feed manufactured of fish caught from the Baltic Sea are considered as such actions.

7.6.4. Data coverage and Data Quality

Economic data collection of aquaculture sector in Finland combines information from different data sources. Main sources are production survey, Structural Business Statistics of Statistic Finland (SF) and account survey conducted by FGFRI. Financial statements were available for

all firms in Business Register having aquaculture as the main activity. This register gives full coverage in number of firms.

Primary sources of financial statements data in Statistics Finland are direct inquiries and business taxation material supplemented by Business Register data. Data is based on corporate balance sheet and profit and loss account data. Statistics Finland checks for the validity of the data. Any missing data was estimated within stratum. Account data was surveyed by FGFRI by stratified survey to detect the detailed cost structure of fish farms. Cost and earnings estimates were done by design-based and model assisted regression and ratio estimation. The cost variables were estimated with ratio estimation from financial statements. Production survey was collected exhaustively from the producers. Any missing information was estimated by stratum.

There is a difference between EUROSTAT data and DCF data as the aquaculture production data of Finland in EUROSTAT includes only food fish production and no juvenile or fry production. In addition the production volume in EUROSTAT includes all aquaculture food fish production in Finland and not only the companies having aquaculture as their main activity. On the other hand, the aquaculture production data in this report includes both food fish production and the juvenile and fry production. And it includes only companies having aquaculture as their main activity.

7.7. FRANCE

7.7.1. Overview of the sector

France has reported the existence of 2986 companies in 2009 whose main activity was aquaculture production. These companies in 2009 sold 265.4 thousand tonnes of aquaculture products with a total value of 760 million Euros.

Marine aquaculture is dominated by seabass with almost 4 thousand tonnes and a value of almost 27 million Euros, followed by seabream (more than 1500 tonnes and more than 8.5 million Euros) and turbot (almost 800 tonnes and more than 9.5 million Euros) in 2008. On freshwater aquaculture it should be highlighted the rainbow trout with more than 32 thousand tonnes and a value of almost 90 million Euros. It should be also highlighted the production of sturgeon caviar, even there were produced only 21 tonnes, it achieved a value of almost 12 million Euros (France Agrimer, 2010).

Shellfish farming is mainly represented by oysters (mostly Pacific cupped oysters, *Crassostrea gigas*) with more than 110 thousand tonnes and a value of more than 260 million Euros and more than 75 thousand tonnes of mussels valued more than 115 million Euros (France Agrimer, 2010).

Table 7.7.1: Economic Performance at national level: France

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	2864	2986	4.3
Total sales volume	TONNE	257269	265399	3.2
Return on investment	%			
Turnover	000 EURO	809986	760067	-6.2
FTE	NUMBER	3424	3690	7.8
Gross Added Value	000 EURO			
EBIT	000 EURO			
Subsidies	000 EURO			
Labour productivity	000 €/FTE			
Capital productivity	%			

The volume of sales has increased between 2008 and 2009 on a 3.2%, but the total turnover has been reduced by a 6.2%.

Employment has increased from 3424 to 3690 workers in Full Time Equivalents (FTE). Unfortunately, not enough data has been provided and mean wages could not be calculated.

Figure 7.7.1: Employment and average annual salary: France

7.7.2. Structure and economic performance of the sector's main segments

As explained before the main segments in France are related to the culture of oysters, mussels and rainbow trout.

Table 7.7.2: Main segments and economic indicators: France

Techniques		On growing	Bottom	Raft	Bottom
Species		Trout	Mussel	Oysters	Oysters
Environment		Freshwater	Saltwater	Saltwater	Saltwater
Number of enterprises	NUMBER	248	337	256	1934
Total sales volume	TONNE	38368	65769	5745	123874
Turnover	000 EURO	128406	119431	13417	401836
Gross Added Value	000 EURO				
EBIT	000 EURO				
Return on investment	%				
FTE	NUMBER	236	300	284	2576
Subsidies	000 EURO				
Labour productivity	000 €/FTE				
Capital productivity	%				
Running cost to turnover ratio	%				
EBIT to turnover ratio	%				

7.7.3. Trends and triggers

7.7.4. Data coverage and Data Quality

The important lack of data reported did not allow to estimate the economic performance of the French aquaculture sector.

7.8. GERMANY

7.8.1. Overview of the sector

The main activities in the aquaculture sector in Germany occur in the fresh water sector, with a production in 2009 of 44,000 tonnes and a value of about 200 Million Euros (around 48,000 tonnes and 205 Million Euros when also including mussels). Main species are trout (25,000 t) and carp (13,000 t). But since the Data Collection Framework only requires Marine Aquaculture to be considered, in Germany economic data are only collected for this segment. It contains of one Oyster Company (annual production of about 1 million pieces) and the blue mussel companies in the North Sea Area (Lower Saxony and Schleswig-Holstein). Due to confidentiality reasons only the figures of the blue mussel sector are reported.

The seed mussels are collected from special areas and are then carried to areas where the growth conditions are better for the mussels. These areas are assigned by state authorities for a certain fee and timely limited.

After 1-2 years the mussels are collected from the cultural spots and mostly sold at the mussel auction at Yerseke/Netherlands. The most important markets for mussels from Germany are the Benelux-countries, France and in Germany especially the Rhineland. The collection of the mussels is done by dredges or beam trawl.

The volume of seed mussels varies from year to year. In some years during the last decade almost no seed fall could be observed. With a time lag of one to two years the volume of mussels for consumption varies accordingly. This is the main reason for the fluctuation of income in this sector. The number of companies also varies, but this is more due to changing legal structures of the companies, where sometimes a group of affiliated companies is founded and sometimes disintegrated again. The employment is relatively stable. In 2008, e.g. there was no collection of seed mussels in Lower Saxony

possible as there was no seed fall (coming from a very small volume in 2007 already). This was for the first time in the more than 100 years of this business. This explains the sharp decrease in sales volume in 2009 as shown in table 7.8.1.

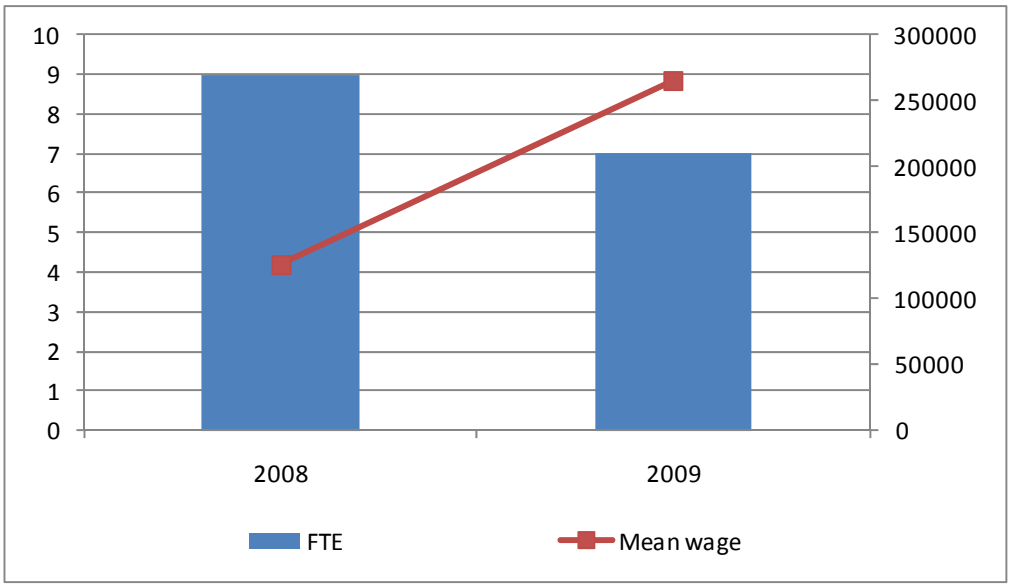
Table 7.8.1: Economic Performance at national level: Germany

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	8	12	50.0
Total sales volume	TONNE	6750	3960	-41.3
Turnover	000 EURO	9695	5016	-48.3
FTE	NUMBER	9	7	-22.2
Gross Added Value	000 EURO		2682	
EBIT	000 EURO		452	
Return on investment	%		3.2	
Subsidies	000 EURO	36	15	-58.6
Labour productivity	000 €/FTE		383.1	
Capital productivity	%		18.7	

Due to these circumstances, assumed to be mainly caused by the expansion of the pacific oyster (*Crassostrea gigas L.*), some fishermen started to collect seed mussels by longline technique and smart-farms. This technique of collecting the young mussels has now widely spreaded as an additional technique to collect the mussels.

The following figures show the development of the employment and average wage in 2008 and 2009. The increase in 2009 seems to be implausible and is maybe caused by weak quality of the original data. Therefore the table should be taken cautiously.

Figure 7.8.1: Employment and average annual salary: Germany



The following table presents some indicators for the sectors economic profitability. In general the performance of the sector has been quite well.

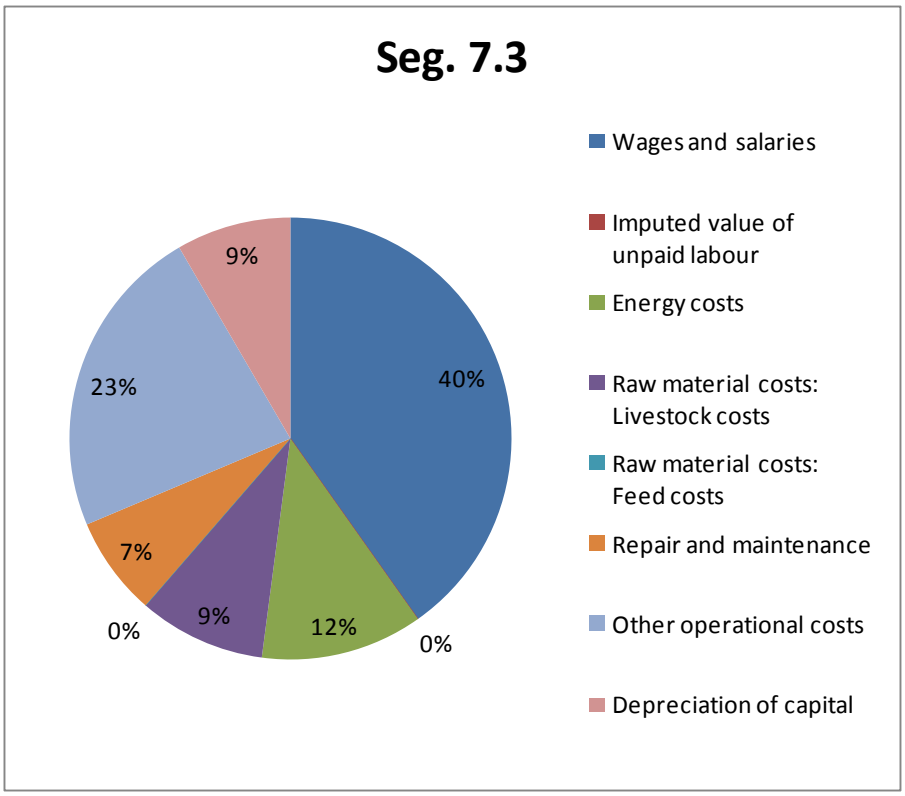
Table 7.8.2: Main segments and economic indicators 2009: Germany

Techniques		Mussels
Species		Bottom
Environment*		Saltwater
Number of enterprises	NUMBER	12
Total sales volume	TONNE	3960
Turnover	000 EURO	5016
Gross Added Value	000 EURO	2682
EBIT	000 EURO	452
Return on investment	%	3.2
FTE	NUMBER	7
Subsidies	000 EURO	15
Labour productivity	000 €/FTE	383.1
Capital productivity	%	18.7
Running cost to turnover ratio	%	84.3
EBIT to turnover ratio	%	9.0

According to the problems with the seed fall and the growing costs of collecting seed mussels by longline technique and smart-farms the profitability decreases from the cost side. On the other hand mussel prices vary quite heavily. The average prices per year for the Mussel fishers from Lower Saxony can be between 0.90 or 0.85 Euros (in 2005 and 2010) and 1.89 or 1.72 Euros, in 2006 and 2008 respectively.

The following figure shows the cost structure of the sector.

Figure 7.8.2: Operational costs structure for mussels bottom segment: Germany



Summarizing, mussel fishery is still profitable, but the sector is facing some threads: It could be a problem for some fishers if a longer period of bad seed fall coincides with low prices. Than some fishers with a low capital basis have to quit the business. The main problem will be to have enough seed mussels in the next years and this is quite uncertain. Additionally the fishermen are faced with problems of siltation on the cultural areas.

7.8.2. Data coverage and Data Quality

The data quality is increasing as the mussel fishers are being more and more willing to support the data collection. This is not at least due to good personal contacts between the scientist collecting the data and the fisherman representatives. It takes some years with several face-to-face contacts to build up trust, especially as really sensitive and normally confidential data are collected. So even if especially the salary data seem to be questionable the overall data quality may be described as quite well and as the sector is quite small, further improvement in data quality could be expected.

7.9. GREECE

7.9.1. Overview of the sector

During the past decade, the Greek aquaculture sector achieved rapid expansion in terms of capital investment and production.

Marine aquaculture, the leading segment of the sector, produces mainly two finfish (seabass - seabream) and shellfish (mussels). Relatively small quantities of tuna and "new marine farmed species" are also produced. Main production technique is cage farming for finfish while longline and bouchot[1] are the main production techniques for mussels. Freshwater aquaculture produces mostly trout in tanks.

Shellfish and freshwater aquaculture consists mainly of small family enterprises. Marine finfish aquaculture experienced concentration through acquisition of small companies by large enterprises in the past few years. Large enterprises, most of which are listed in the Athens Stock Exchange Market, dominate the marine aquaculture industry. As the issue of new farming site licences is suspended for marine finfish, new companies may enter the sector only through acquisitions.

The number of companies presented below (1,040 for 2009) refers to farming sites rather to legal entities.

Production volume rose by 2.9 % between 2009/2008 and reached 117,925 tonnes in 2009, while at the same period sales value rose by 4.4 % to reach more than 392 million Euros in 2009 (see Table 7.9.1).

[1] Marine pilings for growing mussels

Table 7.9.1: Economic Performance at national level: Greece

variable	unit	2008	2009	%Change
Number of enterprises	NUMBER	1038	1040	0.2
Total sales volume	TONNE	114572	117925	2.9
Turnover	000 EURO	375758	392114	4.4
FTE	NUMBER			
Gross Added Value	000 EURO			
EBIT	000 EURO			
Return on investment	%			
Subsidies	000 EURO	4519	5020	11.1
Labour productivity	000 €/FTE			
Capital productivity	%			

Production expansion and excessive supply by the marine finfish aquaculture was followed by a rapid decline of price during the reporting period.

FTE, salary and cost data are not provided by Greece. Lack of economic data limits the discussion of the economic performance of the sector.

Subsidies, presented above, refer also to FIFG funding which was extended till the end of 2009 for Greece.

7.9.2. Structure and economic performance of the sector's main segments

Marine finfish aquaculture (Seg 3.4), mostly producing seabream and seabass, is the leading segment of the sector, both in terms of production volume (76 % in 2009) and in terms of value (88 % in 2009). Hatcheries & nurseries production of marine finfish (Seg 3.1), being just a part of the vertically integrated industry, yet outperforms to all other segments of the sector in terms of value. Total sales volume of hatcheries & nurseries production segment presented below, is likely to refer to total number of fingerling production which are either stocked by the producers or sold to on-growing farms. In contrast, turnover is likely to refer solely to fingerling sales.

Mussel aquaculture (Seg 7.2) is the second most important segment of the marine aquaculture. During 2009, in Greece, 604 farms operated and produced 21,188 tonnes of mussels with a turnover of 8.9 million Euros.

Freshwater aquaculture consists mainly of 83 trout farms (Seg 2.3) which produced 2,298 tonnes of trout during 2009 reaching a turnover of 6.75 million Euros. In the same segment, there exist vertically integrated companies producing fingerling, fresh fish and processed fish products.

Table 7.9.2: Main segments and economic indicators: Greece

Techniques		Seg 2.3	Seg 3.1	Seg 3.4	Seg 7.2
Species		Trout	Seabream & seabass	Seabream & seabass	Mussels
Environment*		Freshwater	Saltwater	Saltwater	Saltwater
Number of enterprises	NUMBER	83	0	333	604
Total sales volume	TONNE	2298	396913893	89442	21188
Turnover	000 EURO	6745	83352	346478	8899
Gross Added Value	000 EURO				
EBIT	000 EURO				
Return on investment	%				
FTE	NUMBER				
Subsidies	000 EURO				
Labour productivity	000 €/FTE				
Capital productivity	%				
Running cost to turnover ratio	%	0.0	0.0	0.0	0.0
EBIT to turnover ratio	%				

Lack of economic data, limits the discussion of the economic performance for each segment. Operational costs data are not provided by Greece.

For the benefit of the reader, an estimate of the cost structure for seabream and seabass aquaculture is presented in Table 7.9.3.

Table 7.9.3: Operational cost structure of seabream and seabass culture for 2008: Greece

	Vertically integrated firms	Non integrated firms
Fingerling	11 %	17 %
Feed	56 %	56 %
Salaries	10 %	7 %
Capital depreciation	12 %	7 %
Other operational costs	11 %	13 %

Source: Adapted from the Greek competition Authority, Decision No 492/V/2010

7.9.3. Trends and triggers

As no new licences are issued in Greece for marine finfish aquaculture, companies are expanding only through acquisitions of Greek companies as well as by acquisitions in other Mediterranean countries (Spain, Turkey, Albania). There is no clear evidence if the decision on banning of new licences is motivated by economic reasoning. Although there is an ongoing discussion about use of space in coastal areas, lack of national legislation creates legal problems especially for marine aquaculture.

For the reporting period, leverage of working capital through bank loans is relatively high for aquaculture companies in Greece[2]. This is partly an outcome of the production cycle (16-24 months for portion sized fish). As an effect of the world financial crisis and the Greek debt crisis, availability of working capital through bank loans is expected to decline rapidly in the Greek economy. Hence, Greek aquaculture production is expected to decline. On top, as Greece is the

[2] National Bank of Greece (2010). Sectoral Report: Aquaculture (in Greek). Available at http://tinyurl.com/3entlch

main producer of seabream and seabass in the EU, price for seabream and seabass is expected to rise, as an effect of reduced supply in the market.

Organic aquaculture of seabream and seabass is well under-way during the reporting period. At least on company has already presented final product in the market. Despite the fact that consumers pay a high price premium for organic fish, the market segment for organic fish is expected to remain niche. Considering that food crisis facts tend to become more and more ordinary at world level, food safety concerns need to be addressed for finfish and shellfish aquaculture in the near future.

While the production of "new farmed marine species" rises in Greece, technology issues need to be resolved before these species could be farmed on a large scale. This is also the case for tuna considering that without reproduction technology, production is constrained by capture fisheries therefore by TAC and quota management system.

7.9.4. Data coverage and Data Quality

Official Greek data is often criticised for under-reporting aquaculture production and value for seabream and seabass while lately over-reporting production and value of "new farmed marine species". This is an effect of the licensing scheme followed by the Greek public administration. In 2009, a new decision came into force which allows companies to culture Mediterranean finfish rather than specifying the exact species to be cultured. This new licensing scheme is likely to improve the quality of the Greek data. Nevertheless, maximum volume of production, yet included in the licensing scheme remains a source of error in the official data. For these reasons, Greek data presented in this report is likely to be biased for aquaculture production and value of marine finfish.

There exist differences between the data presented in this report and data available from Eurostat database with regard to production volume for Greece, mainly for 2009. No data on the value of the production is available from Eurostat database for the years 2008 and 2009 by the time that

this report is written. Production volume for 2009 in Eurostat database is reported higher by approximately 4,000 tonnes, while seabream and seabass production is reported higher by approximately 4,600 tonnes. For the same year, mussel production is reported higher by approximately 1,000 tonnes in Eurostat database. Trout only sales are reported here at 2,298 tonnes while in Eurostat database, trout production is reported at 2,588 tonnes. These differences are likely to reflect aggregation issues.

Greek finfish aquaculture is considered to be homogeneous in terms production techniques. Intensive production techniques (hatcheries and cages) are used for finfish production while there exist a relatively small part that uses lagoons for semi-intensive aquaculture. Longline is the main production technique for mussels.

For the reporting period, a small number of large companies are producing the vast majority of fingerings in Greece and, in the meanwhile, the same companies control directly or indirectly (through facon contracts) more than half of the marine finfish aquaculture production.

On company basis two main segments my be identified for marine finfish aquaculture, vertically integrated and non integrated companies. Non integrated companies mostly refer to on-growing farms. On the other hand, vertically integrated companies own feed production units, hatcheries, on-growing units, packing units and, in some cases, fish processing units and national or international logistics centres.

Economic data is publicly available mostly for medium and large sized companies in Greece. Very small and small personal companies are not obliged by law to compile and publish annual financial statements thus economic data is not always available. As the vast majority of Greek shellfish aquaculture is consisted of very small and small companies, economic data is not publicly available.

Data in Greece is considered to be confidential and presentation of data should not allow the identification of individual enterprises.

7.10. IRELAND

7.10.1. Overview of the sector

292 viable aquaculture companies in the state were surveyed for the period 2008-2009. As some of these were engaged in aquaculture production of more than one species and/or using more than one culture technique, the 292 companies were organised into 305 statistical entities to facilitate optimum segmentation while preserving company anonymity.

In Ireland, all aquaculture operations must be licensed under the Fisheries (Amendment) Act 1997 by the Minister for the Department of Agriculture, Fisheries and Food (DAFF). Licences are issued on a site-by-site basis, which means that one aquaculture production company may hold several licences.

There were a total of 1,952 people employed in the aquaculture industry in 2009, of which 614 were in full time employment, 418 were in part time employment and 920 were employed on a casual basis. Overall FTE in 2009 was 976. In 2009, the total volume of the shellfish and finfish sectors was 47,408 tonnes, with a value of 106.6 million Euros.

The species cultured in Ireland are: Atlantic Salmon (*Salmo salar*), Rainbow Trout (*Oncorhynchus mykiss*), Arctic Char (*Salvelinus alpinus*), European Perch (*Perca fluviatilis*), Turbot (*Psetta maxima*) , Blue Mussel (*Mytilus Edulis*), Pacific Oyster (Crassostrea gigas), Flat Oyster, (*Ostrea edulis*) King Scallop (*Pecten maximus*), clam (*Ruditapes philippinarum*), Abalone (*Haliotis spp.*), urchin (*Paracentrotus lividus*) and Algae species (*Laminaria digitata, Palmaria palmata, Alaria esculentia*).

The above species were segmented for the period 2008 -2009 into the following 14 segments: ‘Salmon Hatcheries & nurseries’ (seg. 1.1), ‘Salmon combined’ (seg. 1.3), ‘Trout on growing’ (seg. 2.2), ‘Trout cages’ (seg. 2.4), ‘Other freshwater fish on growing’ (seg. 5.2), ‘Other marine fish combined’ (seg. 6.3), Mussel Long line’ (seg. 7.2), ‘Mussel Bottom’ (seg. 7.3), Oyster

Bottom' (seg. 8.3), 'Oyster Other' (seg. 8.4), 'Clam Bottom' (seg. 9.3), 'Other shellfish Long line' (seg. 10.2), 'Other shellfish Bottom' (seg. 10.3), 'Other shellfish Other' (seg. 10.4).

Table 7.10.1: Economic Performance at national level: Ireland

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	305.00	303.00	-0.7
Total sales volume	TONNE	45008.70	47407.60	5.3
Turnover	000 EURO	93892.19	106566.40	13.5
FTE	NUMBER	1281.00	976.00	-23.8
Gross Added Value	000 EURO	31423.67	33930.92	8.0
EBIT	000 EURO	-8707.69	586.01	106.7
Return on investment	%	-6.8	0.4	105.2
Subsidies	000 EURO		76.6	
Labour productivity	000 €/FTE	24.53	34.77	41.7
Capital productivity	%	24.34	20.33	-16.5

The number of business enterprises actively engaged in aquaculture has remained relatively stable, over the 2008-2009 period. These were organised into 305 statistical entities.

There were a total of 1,952 people employed in the aquaculture industry in 2009, of which 614 were in full time employment, 418 were in part time employment and 920 were employed on a casual basis. Overall FTE in 2009 was 976, down 24% on the 2008 FTE of 1,281. In 2009, the combined volume of the shellfish and finfish sectors was 47,408 tonnes, which was a 5.3 % increase on aquaculture production of 45,009 tonnes in 2008. Harvest value also increased by 13.4 % from €93.9 million in value, to € 106.6 million in 2009.

Employment overall in terms of FTE fell in the industry generally, over the period by 23.8%, while the mean wage/salary rose from €25,000 to €30,000. Labour productivity rose from 24.5 to 34.8 possibly related to the reduction in employment.

Figure 7.10.1: Employment and average annual salary: Ireland

Table 7.10.2: Production volume (tonnes) and value (€) change over the period 2008-2009: Ireland

	Volume(tonnes)		**Value (€'000)**		**Percentage Change**	
Species	**2008**	**2009**	**2008**	**2009**	**Volume**	**Value**
Rope Mussel	10,067	8,981	6,418	4,713	-10.79	-26.57
Bottom Mussel	16,993	17,521	17,294	13,213	3.11	-23.60
Pacific Oyster	6,188	6,488	12,470	13,685	4.85	9.74
Native Oyster	389	358	1,322	1,455	-7.97	10.06
Clam	187	162	1,189	1,093	-13.37	-8.07
Scallop	59	55	339	386	-6.78	13.86
Shellfish Other	4	0	156	29	-100.00	-81.41
Total Shellfish	**33,887**	**33,565**	**39,188**	**34,574**	**-0.95**	**-11.77**
Salmon ova/smolt*	136	196	1,152	1,874	44.12	62.67
Salmon	9,217	12,210	47,117	65,368	32.47	38.74
Sea reared Trout	930	478	3,675	1,667	-48.60	-54.64
Freshwater Trout	799	896	2,223	2,579	12.14	16.01
Others	36	62	538	506	72.22	-5.95

Total Finfish	**11,118**	**13,842**	**54,705**	**71,994**	**24.50**	**31.60**
Total Aquaculture	**45,005**	**47,407**	**93,893**	**106,568**	**5.34**	**13.50**

The volume of this category is expressed as individuals so is not included as a tonnage

7.10.2. Structure and economic performance of the sector's main segments

Ireland has a relatively diverse aquaculture sector operating across a number of different sub sectors. The main species produced in Ireland are blue mussel (*Mytlus edulis*), native oyster (*Ostrea edulis*), Pacific (gigas) oyster (*Crassostrea gigas*), Atlantic salmon (*Salmo salar*) and rainbow trout (*Oncorhynchus mykiss*).

The above species as said earlier, were segmented for the period 2008 -2009 into 14 segments. Each segment contains the following Data:
'Salmon Hatcheries & nurseries' (seg. 1.1): Contains all entities whose final product for sale is smolt. 'Salmon combined' (seg. 1.3): Contains data from entities producing a final salmon product from a combination of hatchery and cage based enterprises. 'Trout on growing' (seg. 2.2): Contains all freshwater reared trout production data. 'Trout cages' (seg. 2.4): Contains all seawater reared trout production data. 'Other freshwater fish on growing' (seg. 5.2): Contains all Perch and Char Production data 'Other marine fish combined' (seg. 6.3): Contains all Turbot production Data. 'Mussel Long line' (seg. 7.2): Contains all mussel Long line production data, plus between 50 and 100 tonnes of 'raft' production data. The latter technique was not segmented separately due to its minor role in the production effort of the entities involved over the period. 'Mussel Bottom' (seg. 7.3): Contains all mussel bottom culture production data. 'Oyster Bottom' (seg. 8.3): Contains all oyster bottom production data. 'Oyster Other' (seg. 8.4): Contains all bag and trestle production data. 'Clam Bottom' (seg. 9.3): Consists of all clam production data. 'Other shellfish Long line' (seg. 10.2): Home of all algae production data until a suitable 'algae' segment is available. 'Other shellfish Bottom' (seg. 10.3): Contains all Scallop production data. 'Other shellfish Other' (seg. 10.4): contains all urchin and abalone production data.

Shellfish production volume and value has continued to decline since 2007 despite the overall upward trend in aquaculture production in 2009 from 2008. Finfish production volume and value are responsible for the overall increase in aquaculture volume and value, due mainly to the recovery of salmon production. Production in this sector is expected to grow farther.

Table 7.10.3: Main segments and economic indicators: Ireland

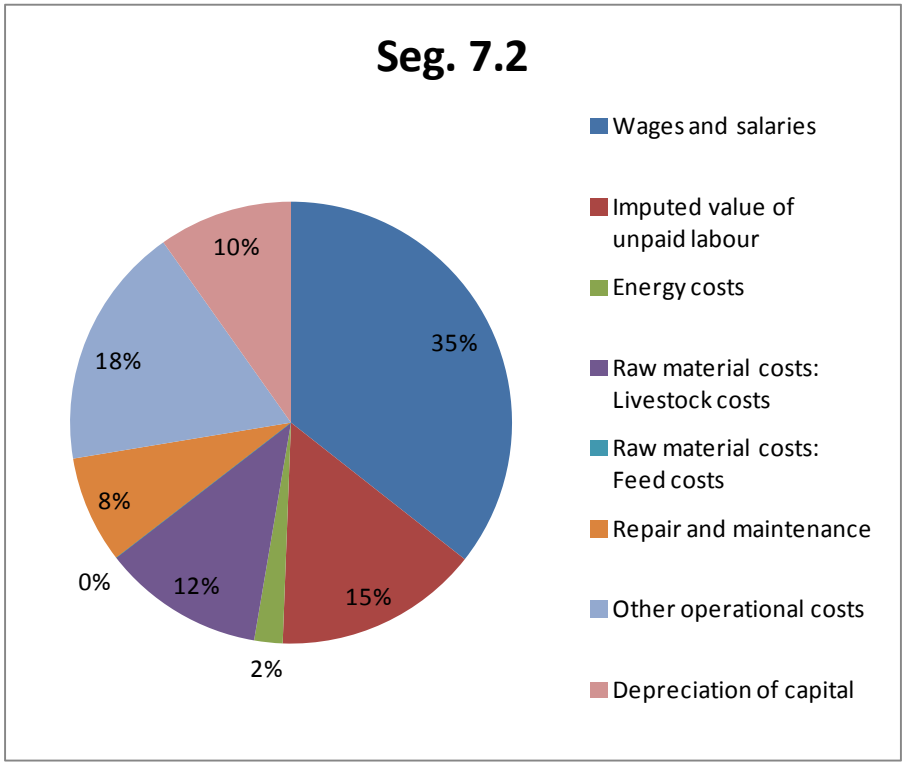
Techniques		Longline	Bottom	Other
Species		Mussels	Mussels	Oysters
Environment*		Saltwater	Saltwater	Saltwater
Number of enterprises	NUMBER	70	36	130
Total sales volume	TONNE	8981	17521	6488
Turnover	000 EURO	4713	13213	13685
Gross Added Value	000 EURO	3886	2828	5215
EBIT	000 EURO	1349	-1733	-1149
Return on investment	%	5.6	-6.5	-5.1
FTE	NUMBER	128	170	295
Subsidies	000 EURO			
Labour productivity	000 €/FTE	30.4	16.6	17.7
Capital productivity	%	16.3	10.6	23.2
Running cost to turnover ratio	%	80.4	100.0	99.0
EBIT to turnover ratio	%	29	-13	-8

Shellfish production volume and value has declined over the period, despite the overall upward trend in aquaculture production in 2009 from 2008 (down 1% in volume and 11.8% in value). Employment in shellfish aquaculture has, as a consequence, fell from an FTE of 1065 in 2008 to an FTE of 776 (-27.14%) over the period. The number of enterprises has remained stable, over the period.

Mussel Longline: Rope Mussel production has shown the sharpest decline, down from 10,067 tonnes in 2008, to 8,981 tonnes in 2009 (a drop of 10.8%). A corresponding drop in value was farther depressed by a drop in unit price from €638 to €525 per tonne. Production value for the

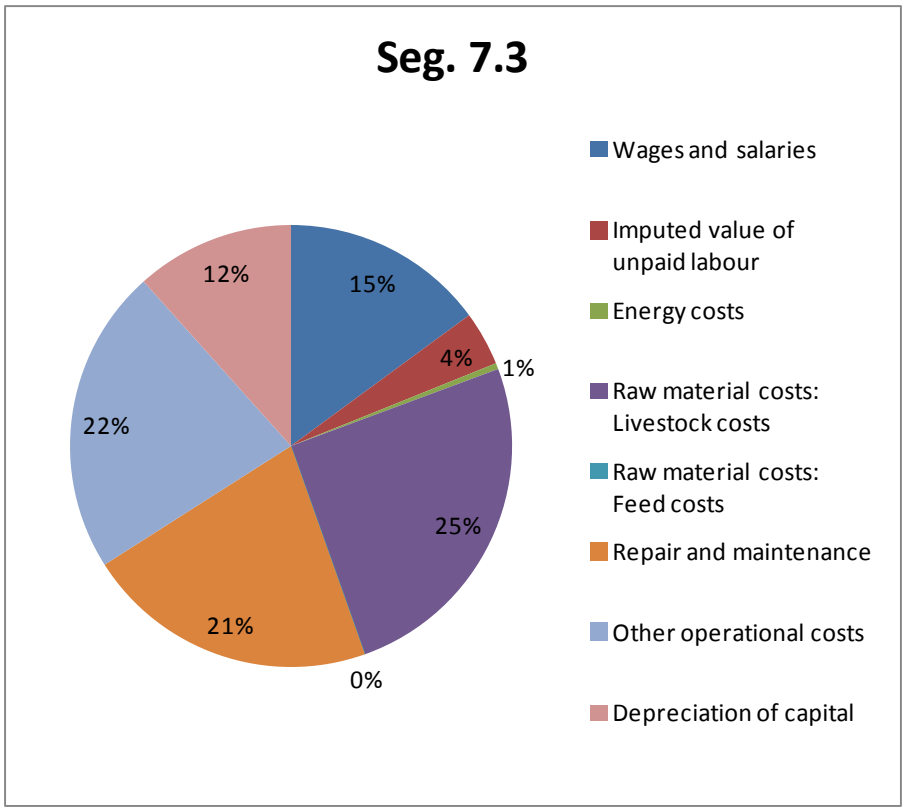
sector fell from €6,418,169 in 2008 to € 4,713,095 in 2009 (-26.6%). Employment similarly has declined sharply, over the period, from an FTE of 213 in 2008 to an FTE of 128 in 2009.

Figure 7.10.2: Operational costs structure for the segment mussels longline: Ireland



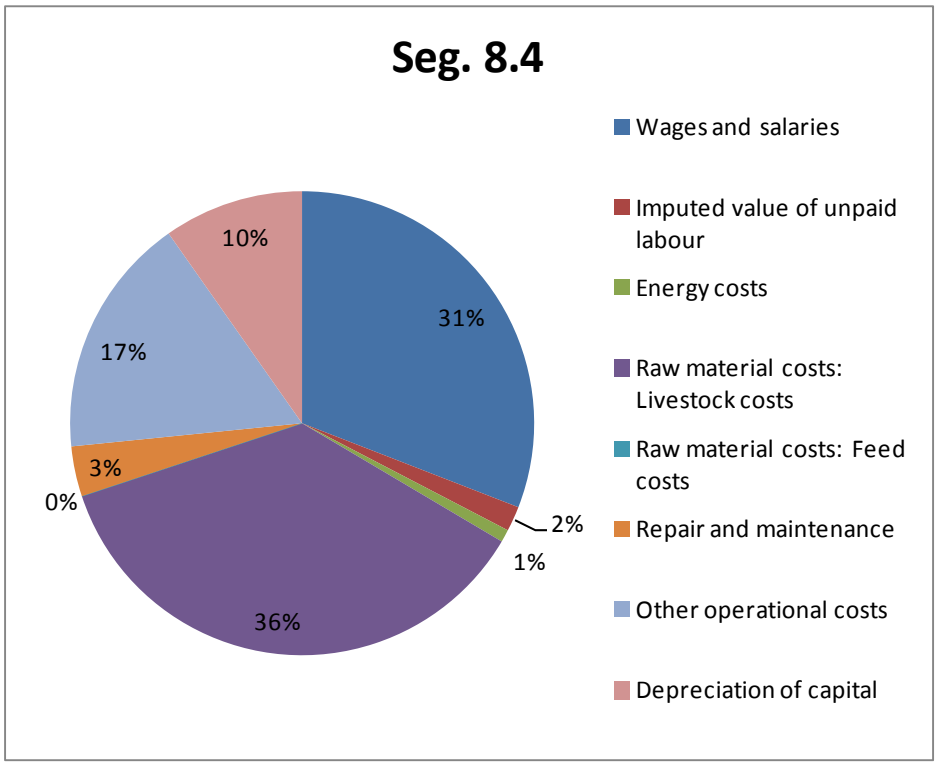
Mussel Bottom: Bottom mussel volume increased modestly over the period but unit value declined sharply; from €1,018 in 2008 to €587 per tonne in 2009, causing an overall decrease in national production value, despite the increase in tonnage. Volume increased from 16,993 tonnes in 2008 to 17,521 tonnes in 2009 (+3.1%). Value dropped from €17,294,290 to €13,213,050 (-23.6%). Employment in bottom mussel culture dropped over the period from an FTE of 178 to 170.

Figure 7.10.3: Operational costs structure for the segment mussels bottom: Ireland



Oyster other: Gigas Oyster production showed modest increases in production volume and unit value; 6,188 tonnes at €2,015 per tonne in 2008 to 6,488 tonnes (+ 4.8%) at €2,109 per tonne in 2009. Production value consequently rose from €12,469,469 to €13,685,215 (+9.7%), over the period. Employment for the period dropped however from an FTE of 347 in 2008 to 295 in 2009 (-14.9).

Figure 7.10.4: Operational costs structure for the segment oysters other: Ireland



Salmon Combined: Finfish production volume and value are responsible for the overall increase in aquaculture volume and value, due mainly to the recovery of Atlantic Salmon production, up from 9,218 tonnes to 12,210 tonnes (+32.46%) and the growth of the organic salmon component in particular, to 68% of overall salmon production. Production value rose from €47.1 million in 2008 to €65.4 million in 2009 (+38.7%). Production of Atlantic Salmon is expected to increase significantly over the next several years. Employment in salmon production fell from an FTE of 122 to 119.

Salmon Hatcheries & nurseries: Smolt Production over the period as expected reflects the upward trend in salmon production, rising from 136 tonnes of production in 2008 to 197 tonnes in 2009 (+44.85%).Production value of smolt for sale rose from €1.2 million to €1.9 million (+41.7%). Employment rose from an FTE of 36 in 2008 to an FTE of 39 in 2009.

Trout ongrowing: Production volume and unit value for freshwater trout increased from 799 tonnes at €2.78 per kg to 896 tonnes at €2.88 per kg. (+12.14%). Production value rose therefore from €2.2 million to €2.6 million (+16%) over the period. Employment rose from an FTE of 16 to 17, over the period.

Trout cages: Sea reared trout production fell from 930 tonnes at €3.95 per kg to 478 tonnes at € 3.49 (-48.6%). Production value overall fell therefore from €3.7 million in 2008 to €1.7 million (-54.6%) in 2009. Employment in FTE fell from 15 to 9 over the period.

7.10.3. Trends and triggers

Perch production in Ireland is expected to increase due to the presence of a consistent and undersupplied market in Europe. Environmental conditions, particularly within the BMW region of Ireland provide many potentially suitable sites for perch culture, while Ireland is currently at the forefront of Perch hatchery technology.

The Pacific Oyster sector is reliant on the importation of seed for its stock input. This leaves it vulnerable to importing a Herpes virus that has caused significant losses in some production bays. A number of strategies are being pursued to combat this.

Research is underway to find alternatives to buying in Pacific Oyster seed for on-growing at Irish sites. Remote settling is a relatively inexpensive method of obtaining a commercially viable level of larval settlement, while the feasibility of setting up an Irish hatchery to supply seed locally is under study.

There is a move towards buying in seed to Irish sites in the autumn so that when the virus strikes during the following summer, the animals are bigger and more resilient. Producers in some bays are adopting the practice of growing seed to an intermediate size (20-40 grams) and sending the half grown stock to ‘finishing’ bays with relatively low average temperatures.

Application procedures are underway with the intention of establishing deep water Organic Atlantic Salmon production at selected sites. If successful, production would be expected to increase very significantly in this sector over the following few years with possibilities for the increase in the production of algae within the areas licensed.

Outlook for 2010 and 2011

In 2010, 2011 and beyond, production in the finfish sector is increasing steadily and is set to continue, due mainly to the expansion of Organic Salmon production. Unit value for the organic sector is holding steady and is expected to continue so as the organic market remains undersupplied. Perch and Turbot production, both relatively new aquaculture sectors in Ireland, are set to increase from what is currently a small base. Trout production over the period has remained steady and is expected to remain so to 2012.

Shellfish production is limited to the inshore zone and as such is competing with an ever increasing number of other interests for use of a finite supply of foreshore sites and water bodies. Mussel seed supply, though found within state inshore waters, undergoes natural fluctuations in quantity and quality annually with the result that production in both the bottom and suspended sectors is expected to fluctuate accordingly within an overall licensed production area that is unlikely to expand significantly in the near future. Value of bottom mussels remain low in 2010 from a 2008 high of over €1000 per tonne, while suspended culture mussel value has shown a modest recovery from a 2009 low of €525 per tonne . Production and prices for Pacific oysters have steadily increased from 2008 to 2010. Increased value for the latter sector and suspended mussels recently is due in part to difficulties of local supply in France. Long term production levels in all three sectors may therefore not change significantly before 2012. Similarly the other shellfish sectors such as Flat Oyster, Scallop, Clam, Abalone and Urchin production are expected to remain at similar levels of production to 2012 as current, while alga production is expected to increase modestly over the period.

7.10.4. Data coverage and Data Quality

Data quality

The economic data for the Irish aquaculture industry is sourced from two surveys. The first is the mandatory census on production and employment that is targeted at all licensed aquaculture operators. The second is the 'Costs and Financial' Survey (C&F survey) which is a non-probability sample survey that is sent to a 20% profile of the total aquaculture operator population.

The census survey design is species and technique specific and relates to specific licensed sites. Several separate forms may be sent to an individual operator if they have several sites and facilities e.g. a hatchery and separate on-growing site. Whereas the Costs and Financial Survey relates to the trading entity and can include operations at multiple sites.

The sample for the Costs and Financial Survey is made from the known client base so as to give as good as possible coverage of the scale and types of operations involved in aquaculture. Participants are chosen so as to cover all the main methodologies of culture for the various species as well as by entity size so that a good cross section of the overall production tonnage and value is achieved. Farms selected for the costs and financial survey are contacted in advance to inform them of the survey; this will be followed up by site visits to interview the owners and assist with filling out the survey questionnaire, if required.

Both surveys are posted to all known aquaculture operators, early in the year following the production year of interest. The census has been conducted over a period of years and form design has evolved with the input of industry. It seeks data for 13 of the 29 variables sought in the DCF. The response rate over the lifetime of the census has varied between 80 and 90% of the total population of aquaculture entities, indicating the level of quality of the data collected.

A specified time frame of one month from the estimated postal arrival date is given to survey form recipients, after which, follow up phone calls are made and/or site visits are carried out in conjunction with other work in the area to complete the form. If data is not forthcoming from a

given entity for the survey year, estimations are made, based on previous data gathered and/or based on information held by the area officer of the entity.

A time span of three months is planned for completion of raw data collection, followed by three months of collation, analysis and report presentation

Target Population

The target population for the census is all licensed fish farming enterprises operating in Ireland, as defined by NACE code 05.02 “Fish Farming”. For the period 2008-2009 this is a total of 305 commercial enterprises currently active in all segments and represent over 90% of the total number of entities engaged in the aquaculture sector. For the Costs and Financial Survey a non-probability sample population of 20% of the commercially trading entities of the census survey population is selected.

Appendix X and XI of Commission Decision (2008/199/EC) are used as guidelines for collecting all economic variables on the aquaculture sector. In accordance with Appendix XI of Commission Decision (2008/199/EC) the segments are defined by the target species and farming techniques.

The remaining entities (State and University hatcheries and nurseries and other non commercially viable entities) producing a volume of shellfish or finfish by aquaculture practice are either classed as non commercial or unviable for economic survey and are excluded from the costs and financial survey. This position is reviewed annually. An overall sampling rate of 20% of the target population is deemed sufficient to get a representative sample of enterprises in the sector for the costs and financial survey.

Determination of sample size

As stated for the census survey a 100% sample target is selected. For the costs and financial survey a target of 20% was selected so that there could be a certain amount of variation and rotation amongst the participants in order to avoid a data collection regime that would be too rigorous and invasive on particular individuals in the aquaculture sector.

Sample evolution over time, rotational group

A key component of the selection of the participants for the costs and financial survey is based on the detailed industry knowledge of the survey team. Such participants have been initially selected who are known to be efficient and willing to provide information in a detailed and timely fashion. It is envisaged that in the current reference period of 2011 to 2013 that this cohort will be rotated so that the detailed survey will be completed by a particular participant once ever two to three years.

Estimation methods from sample to population

In the case of non returns for the census survey, the most recent production and employment data for a given enterprise may be used, in consultation with the local Aquaculture Area Officer and other relevant sources, to make the best estimate for the enterprise. Approximately 15% or less of the entire population engaged in aquacultural practices have required such an assessment in the past. If a participant has a history of non returns over several years then a site visit is arranged to collect the information.

For the cost and financial survey for which a 20% sample return is targeted the 100% estimation of the variables is made on a species and segment basis. The specific variables are calculated based on what percentage of total production volume the sub sample constitutes, as determined by the census and the subsample sum is simply divided by that percentage and multiplied by 100 to bring it to the 100% population estimate for the variable.

Estimation of unpaid labour

Expected cost for ‘Wages and Salaries’ for a given company, calculated from that company’s FTE and the minimum wage of the period was compared to the actual costs stated for ‘Wages and Salaries’. A positive difference was taken to be the imputed value of unpaid labour.

Data Precision

There are no stated precision requirements for collecting data in the aquaculture sector. As such, the Member State is using percentage coverage of the segments as a measure of quality for

parameters not collected exhaustively. The initial sample set is compiled from the current and up to date aquaculture licence data base held by BIM which is cross checked and updated with the DAMF applications and approvals as well as local site visits to farms by BIM personnel.

Data availability

For cost and financial variables collected through the annual survey, data for a particular reference year will be fully validated and available approximately 12 months from the end of the reference year. Certain data collected via questionnaire and/or interview from companies will be validated, where possible, against their published end-of-year or abridged accounts. Data for a particular reference year is collected at the start of February of the following year. A three month period follows before all data is received from those targeted in the survey, with an additional two months for data procession, and validation before the data are ready for transmission.

Production and employment data will be available 8 months after the end of that calendar year: data for a particular reference year is collected at the start of January of the following year. A three to six month period follows before all census forms are received, with an additional 2 months for data processing, and validation before the data are ready for transmission.

Confidentiality

Data collected is treated as confidential and shall not be disclosed in any format whereby the companies or individuals can be identified. All primary data is stored electronically in a secure database, and is protected under the terms of the Data Protection Acts.

Homogeneity of the segments in terms of techniques and species.

Data for 2008 and 2009 has been segmented out as far as is practical to the level of species and to a particular culture technique or life cycle stage technique of that species. Farther segmentation was deemed impractical and disaggregating data to the point where individual company data would be exposed and confidentiality compromised. Within segments containing data of the minor production segments, data was not farther segmented beyond species level for the above reason. Farther segmentation has however been proposed for the 2011-2013 period.

For the major shellfish species produced, with the exception of approximately 50 tonnes of raft mussel data (of one company) included in rope mussel data and 15 tonnes of bottom Pacific oyster (of one company) included in trestle culture data, the relevant segments contain homogenous data from a particular culture technique of a particular species.

In the case of Atlantic Salmon culture, there are entities that engage in more than one culture technique, using more than one enterprise to produce the final product for sale i.e. using hatcheries, on-growing sites and harvesting sites to produce the final product. The economic data could not be extracted for each component enterprise but was provided as 'combined' data, built around the turnover created by the sale of the final product. Such data was recorded as a 'combined' method of culture for the species.

Differences with other official data sources

Irish aquaculture data, sent to Eurostat, FAO and OECD all comes from the census survey mentioned above which also provides data to the EU's DCF (Reg. 199/2008) survey. Data for the other three agencies may need to be rearranged in some segments to allow for their requirements to separate all production volumes and associated values destined as raw material for farther production in the state, from finished product farms, such as those from shellfish hatcheries or 'half grown' shellfish farms (eg. Pacific Oyster culture), for which no separate segmentation is considered in the regulation.

Volume and value Data from the annual census survey is entered onto the templates sent by Eurostat and the templates are then sent to them via their 'Edamis' portal. The same data has been sent to FAO on their datasheets for some years. No data anomalies other than that caused by the differing segmentation requirements regarding some shellfish species/techniques between Eurostat, FAO and DCF for Annual Irish Aquaculture production is envisaged.

7.11. ITALY

7.11.1. Overview of the sector

The aquaculture started with the traditional farming of freshwater species, main trout, carp and sturgeon. The segment of trout is still the most important fish production sector in terms of turnover and volume. In the 2009 the aquaculture sector contributes an average of 40 % in volume and around 28 % in value on the total Italian fishery performance (according EUROSTAT source).

Italian aquaculture is characterised of the high level of specialization, industrialization and large scale production and in the EU it is the third producing country.

The total of the legal entities, in the 2007, was 826 that was reduced in 2010, according National Program, at 754.

In the Italian aquaculture sector has been registered, in the last 5 years, a metamorphosis in the structure of the enterprises, mainly related to the dimension, process of production and number of employees.

The most efficient firms have been confirmed their market position, thanks to vertical integration and their high financial strength and stability.

The Italian sector, until 2008, was represented by small size enterprise, with no more than 5-10 employees and based on the concept of family run business. After 2008 the small size enterprises decreased and, in some cases, the bigger companies took over the smaller companies.

The period under review is characterised by a change in costs and revenues, resulting as loss of efficiency of production process. The Italian aquaculture is characterized by a extreme stiffness of the productive structure, seen from the invested capital compared to the turnover (the turnover

of capital is less than unity). The fixed investment (fixed assets) are a very heavy share capital. Another aspect represented by inventories (stocks) than investments. The sector is also hindered by a high incidence of variable costs of raw materials, mainly feed, energy and fry. The continuous variations in these costs have an impact on the income statement and make aquaculture very weak in negotiating with the modern distribution channel.

The bigger segment of aquaculture production is mussel long-line technology, followed by clam bottom technology. The shellfish production fluctuates around 105,000 tonnes (EUROSTAT, 2008) and, in the 2009, has registered an decrease around 10 % in volume: the segment of mussel decrease around 26 % in 2009 (EUROSTAT: 76,277 tonnes in 2008 and around 60,982 tonnes in 2009). On the hand of clam production, the performance of increased has contributed to compensate for the loss on mussel segment; the clams production, in 2009, increased more than 16 % (EUROSTAT 2008: 28,612; in 2009 the production in tonnes was 34,220).

The legal status companies in the shellfish segment is mostly co-operative, where every worker is also member of the organization and their consortiums operate through a government grant aimed at the management of a marine area. The macro-aggregate of “shellfish” are not capital intensive, while the analysis of operating costs is evident that they are labour intensive. The impact of energy costs, mainly fuel for the boats, is another reason for the higher costs of production for the both segments (clams and mussels). Related to the fish-cultured species, the segments most representative, as in reproduction (hatchery and nursery) than in on-growing activities, are the sea bass and sea bream in tanks and in cages. All segments of sea bream and sea bass fish farms, are capital intensive, high value-added technology. Many of the investments are oriented to the adoption of the best existing technologies that can reduce their negative environmental impacts and to improve relationship with stakeholders. The costs in health care and safety, as well as union agreements, determine the highest labour costs among European MS, and among the direct competitors in the Mediterranean. On average, staff costs in the segment is among the highest in cages approximately 24 % of operating costs, and even more in the on-growing segment, where are more than 40 % (Seg.3.2).

Table 7.11.1: Economic Performance at national level: Italy

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	0	0	
Total sales volume	TONNE	31811	32458	2.0
Turnover	000 EURO	56649	95804	69.1
FTE	NUMBER			
Gross Added Value	000 EURO	-21642	45277	309.2
EBIT	000 EURO	-44556	26151	158.7
Return on investment	%	-79.3	20.1	125.3
Subsidies	000 EURO	261	390	49.5
Labour productivity	000 €/FTE	-35.2	29.8	184.6
Capital productivity	%	-38.5	34.7	190.1

According the data reporting in the table 1.1, in the 2009 the turnover increased more than 69 %, but in terms of the supply, the total of sales are increased only around 2 %. The profitability (ROI is 20 %) of Italian aquaculture, is high and, maybe, overestimated, if it considers, a very depressed economic situation as that of the last two years. The previous observation is further validated when we look at the performance of return on investment (ROI) recorded in 2008, where the negative value (-79 %) cannot be explained either in terms of the downturn in the economy and financial stability that, in general, have influenced all economic activities throughout the EU.

On the hand of productivity of labour, in the 2009 increased more than 180 % rather than the previous year; making a comparison between the value of “labour productivity” with average salary wage in the aquaculture sector, it possible to note that the performance is much smaller and contained, than might appear from an initial observations become. Very bad performance on the labour productivity in 2008, may be linked to the endogenous factor of “momentary suspension” for workers, temporary layoff.

The positive trend of capital productivity in 2009, has been direct generated by the resumption of economic and financial stability of aquaculture, but is related to the level of specialization and maturity in the market for Italian companies, too.

The leading segment, in Italian aquaculture, is represented by the shellfish, especially clams, that push the economic performance of the aquaculture national sector thanks to binomial “gross sales volume and stable average prices per kilogram”.

Figure 7.11.1: Employment and average annual salary: Italy

The total employment in aquaculture related to 2009, 1,521 employees, an increase compared to 2008, over 52 %. Although it has been increased, the number of employees is too small compared to the national production company, primarily to segments of fish farming.

On the hand of costs of labour (wages and salary, comprehensive of insurance and security costs), the performance between 2009/2009 shows a decreased of the total average wage. In any case the wage is under minimum salary for the referring sector.

In the figure is not available the total amount of FTE, so all calculation are refers to the total employees.

7.11.2. Structure and economic performance of the sector's main segments

The increase in production which has characterized the positive trend in Italian aquaculture over the last ten years was supported by both the consolidation of production in tanks and by the development of off-shore fish farming techniques. In this context, despite the diversity in terms of species and fish farming technology. the analysis of the main trends refers to five (5) main production segments considered within the present country report:

- Sea bass & Sea bream on growing (seg3.2)
- Sea bass & Sea bream combined (seg3.3)
- Sea bass & Sea bream cages (seg3.4)
- Mussel Long line (seg7.2)
- Clam Bottom (seg9.3)

Companies in the saltwater segment are mostly joint-stock companies with average annual production over 100 tons per production unit. This sector is characterized by the predominant presence of sea bass and sea bream farming which reached production levels of 12,500 tons (EUROSTAT 2009). It is also to be noted that some installations specialised in the farming of sea bass and sea bream. have diversified their production to include the farming of innovative species (*Diplodus sargus* -White Sea-bream, *Puntazzo puntazzo* -Sharp-Snout Sea-bream, *Ombrina cirrosa* –Umbrine, *Dentex dentex* –Dentex). These species have reached production levels of around 5,000 tons.

As regards cages, the diffusion of different types of equipment is noted: floating or buoyant. sunken and submergible. In general the productivity per volume unit in farming with cages is less than that of installations on land (18-30 Kg/m^3). In this context, considering the high investments of capital necessary to develop these activities, a consistent presence of joint-stock companies is evident. Among medium and large-sized farms, the vertical integration of the production process is common: the presence of fry nursery/hatchery in the farming installations guarantee supply for both internal use and the supply of fry to national farms which are not equipped with reproduction installations.

As regards shellfish farming. mussels and clams are the benchmark species, and the farming technique used is mainly off-bottom (long-line). The corporate structure of the mussel farming companies shows a wide presence of co-operatives. The mussels are raised in netting sacks suitable to the size of the shellfish; the netting sacks are hung on long lines held in suspension by a series of floats (a sea farming technique known as long-line), or hung on stakes sunk into the sea bed (coastal or lagoon stake system).

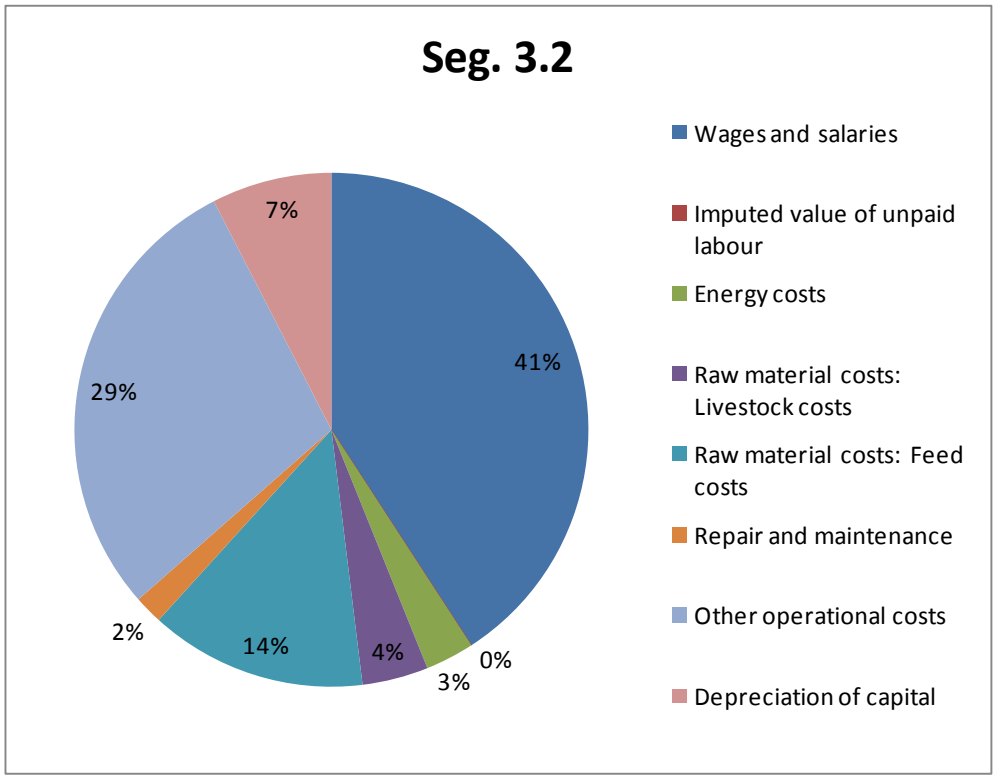
As regards clam farming companies all use on-bottom techniques in water enclosures. Co-operatives also dominate in the case of clam farming but, at the same time, the presence of co-operative consortiums is to be noted. This latter type of organizational structure has been shown to be practical in the rationalisation of the management of the phases of sowing and harvest of natural resources. Clam farming, in fact, has gained its own experience from the fishing world and the correct management of resources implies programming both from the period of spawning and that of fishing. The spawning is done exclusively in the wide areas given in concession by the co-operative or consortium. In the same way the harvest is carried out on the basis of a specific daily programme, where areas and harvest quantities are planned and defined.

Table 7.11.2: Main segments and economic indicators: Italy

Techniques	On growing	Combined	Cages	Long-line	Clams
Species	Sea bass & Sea bream	Sea bass & Sea bream	Sea bass & Sea bream	Mussels	Bottom
Environment*	Saltwater	Saltwater	Saltwater	Saltwater	Brackish water

Number of enterprises	NUMBER	0	0	0	0	0
Total sales volume	TONNE	228	100	942	12016	14578
Turnover	000 EURO	459	16267	2316	14452	45430
Gross Added Value	000 EURO	66	4369	328	6417	28844
EBIT	000 EURO	-324	1813	-870	941	22457
Return on investment	%	-41.2	5.5	-8.7	5.6	76.4
FTE	NUMBER					
Subsidies	000 EURO	1	159	56	135	12
Labour productivity	000 €/FTE	8.3		12.6	19.0	26.9
Capital productivity	%	8.4	13.1	3.3	38.0	98.2
Running cost to turnover ratio	%	162.4	87.7	132.3	93.6	54.2
EBIT to turnover ratio	%	-70.5	11.2	-37.6	6.5	49.4

Figure 7.11.2: Operational costs structure for Sea bass & Sea bream on growing: Italy

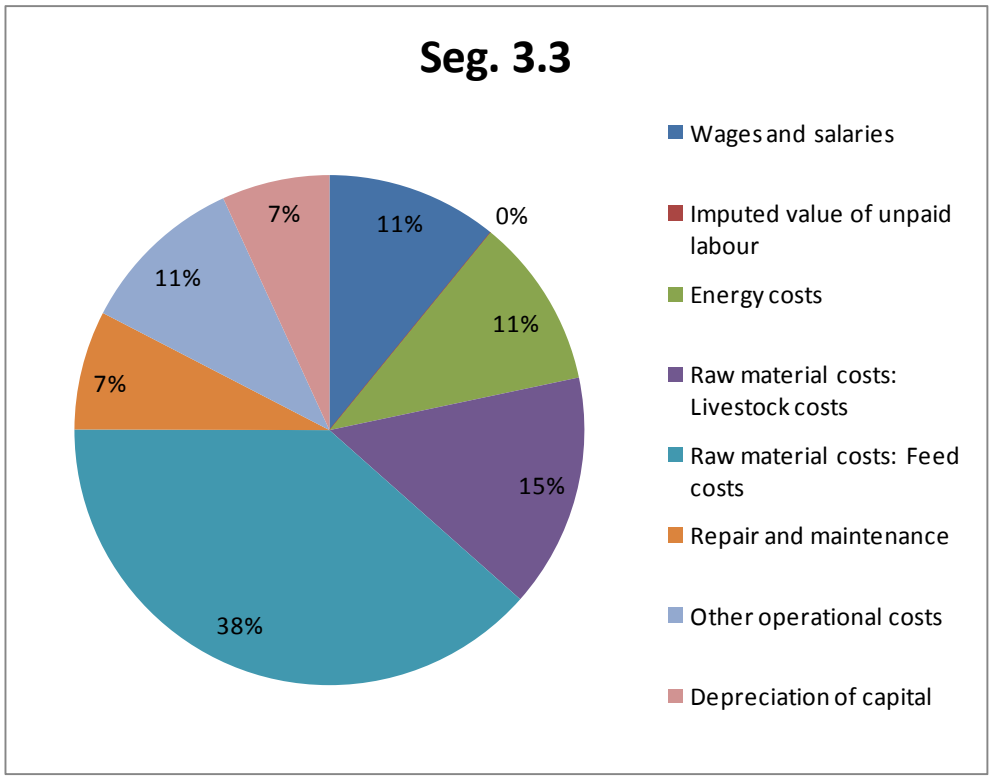


The segment 3.2: “Sea bass & Sea bream on growing” is characterised from tanks and ponds. It is the production segment which has favoured the initial development phase of the offer of saltwater species in Italy. This development was originally encouraged by a high average sales

price. However, since 2000 the price trend has stabilized registering an annual increase of less than 1.5 %. At present the turnover of this segment represents a value of 460 thousand Euros.

The operations cost structure of the segment is typified by a high incidence in the item “wage and salary” that defines a low labour productivity (around 8 thousand Euros) and “other operational costs” where the item for external services dominates. In this case it reflects the tendency to resort to outsourcing aimed at securing greater operations flexibility for the companies in the segment, above all, with regards to repair and maintenance activities. The containment of the incidence of the repair and maintenance costs, which is limited to 2 % of total operational costs, is also a result of this decision. The dependence from raw material is limited only to feeds, on the contrary, for the other items of direct operating costs are down rather than the standard for the segment. The most evident aspect is related to “livestock” cost: it represents around 4 % of operational costs, but doesn’t show the real situation for enterprises of sea bass and bream specialized on reared species, in with all productive items are bought. In terms of economic performance, the segment is unprofitability too much, the ROI of -40 % is in contrast to a mature segment characterised by a high level of technology and strong specialization and in which are balance between the main operational costs with a low quota of depreciation (7 %). In the majority of cases the companies in this segment are managed by joint-stock companies in that the start-up investments for this type of activity are substantial and, on average, amount to a high value, in this context the capital productivity is low at around 1 %. It is also to be considered that the segment is progressively losing its share in the market to the segment raised in cages where the present operations structure is characterized by the presence of companies with consolidated production experience.

Figure 7.11.3: Operational costs structure for Sea bass & Sea bream combined: Italy

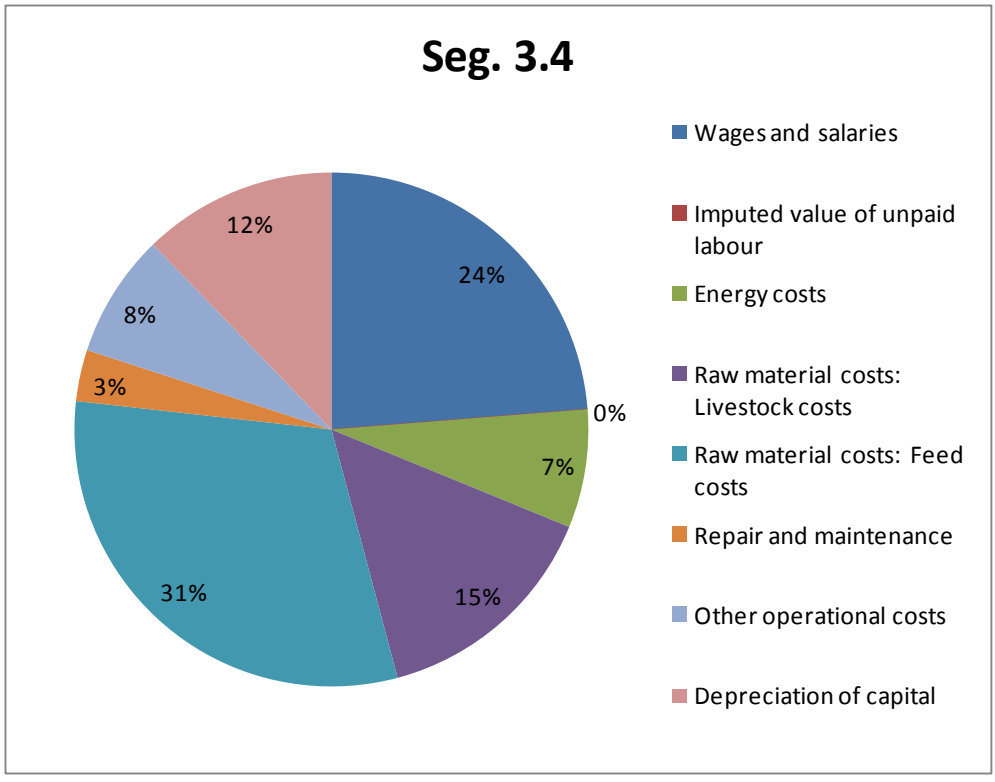


The segment 3.3: “Sea bass & Sea bream combined” is characterised by fish farms in which the process includes different steps: from the re-production of fingerlings until rearing the fish at the commercial size. In some cases, the enterprises include in the segment, produce the livestock only for themselves consume and only for a quota of total fry that they need. The analysis of the structure of operational costs shows that the weight of cost for feed (38 %) is the higher than the others costs: in this case the segment shows strong dependence on certain raw materials for production, such as rotifers and artemia, that represent the “natural feeds” need for the larval and post-larval stage of the fingerlings. According the analysis, the turnover in the combined segment of sea bass and bream is around 16 million Euros, and the EBIT is the 11 % of turnover. As a profitability, the segment is a reliable investment, recording a ROI of more than 5 % and positive capital productivity. The combination of several activities , re-production of fry and on growing, in the same business is possible thanks to the presence of highly skilled staff that

ensures a good level of labour productivity, but is not available the calculation of this ratio, because the number of employees doesn't upload.

On the total operational costs, anyway, the weight of labour cost is around 11 % , as far as energy and others operational costs. The same percentage for labour costs and others operational costs show a trend for the segment to use outsourcing employees for high specialised profiles, as the veterinary and experts in nutrition and food. Referring the expenditure on energy, it's related mainly to the first step of production process, in which are an intensive use of controlled temperature, level of oxygen in the production water and extensive use of artificial light to modify the natural cycle for the "brood fish" (the re-produces fish). In general the segment is profitable thanks to its mature stage in which are important new investments in research and development, as it demonstrates the amounts of subsidies.

Figure 7.11.4: Operational costs structure for Sea bass & Sea bream cages: Italy



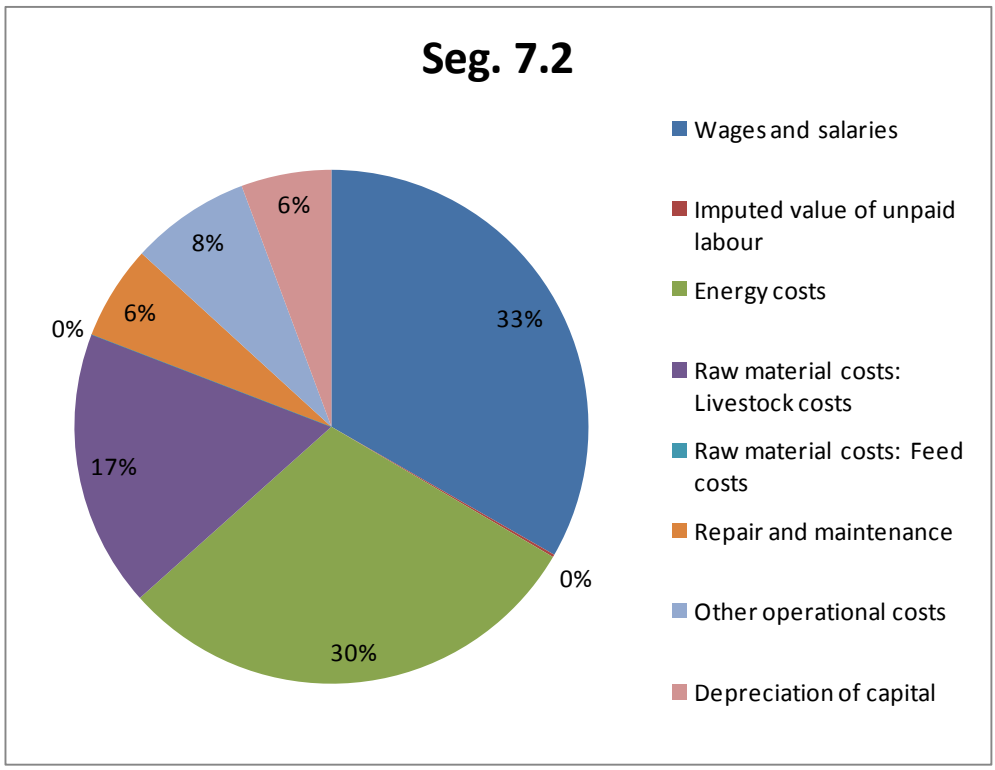
Segment 3.4: The farming of sea bass and sea bream in cages is a production segment which has developed over the last decade. Sales from this segment have at present reached a turnover of 2 million Euros (2009) and reflect a relevant presence in a market characterized by an aggressive price policy. In this market situation the profit margins become ever more restricted and competition has moved to the capacity to contain unit costs of production. The total production in volume around 940 tonnes, with an average price of around 2.50 Euro/kg, too much low price for massive species from mariculture technology. The average profit, in terms of EBIT, is negative and it is around (-) 869 thousand Euros, consequently the negative profitability amount to -8 %. The index of profit compared to the turnover is strongly negative, reaching over (-) 37 %. The segment represents the most important in terms of capital intensive activities. The strong presence of investment in high technologies for the cages is represented to the percentage of depreciation of the capital (more of 12 %). From the financial point of view the degree of capitalization shows that, even though substantial amounts of their own capital have been put into the company, resort to loan capital is yet again shown to be a fundamental element in company management.

In addition the other relevant item is the cost of labour: the personnel cost depends on a high degree of specialization as well as a level of intensive work on land and at sea, on the cages. As referring the feed cost, the efficiency in nutrition process is lower than land based on growing fish-farms of sea bream and bass, for the follow main aspects:

- in marine aquaculture there are more exogenous events that compromise the performance, as wind, tide, temperature of the water, level of salinity, etc.,
- and, referring to the most endogenous aspects, in cages the density for cubic meter, around 25-30 kg/mc, higher than density in inland fish farms and for this the degree of dispersion is greater.

The operations cost structure is characterized by the high incidence of production costs that absorb the most of operational costs, in relation with running costs, the ratio represents a weakness, because the efforts for running cost is more 132 % of turnover.

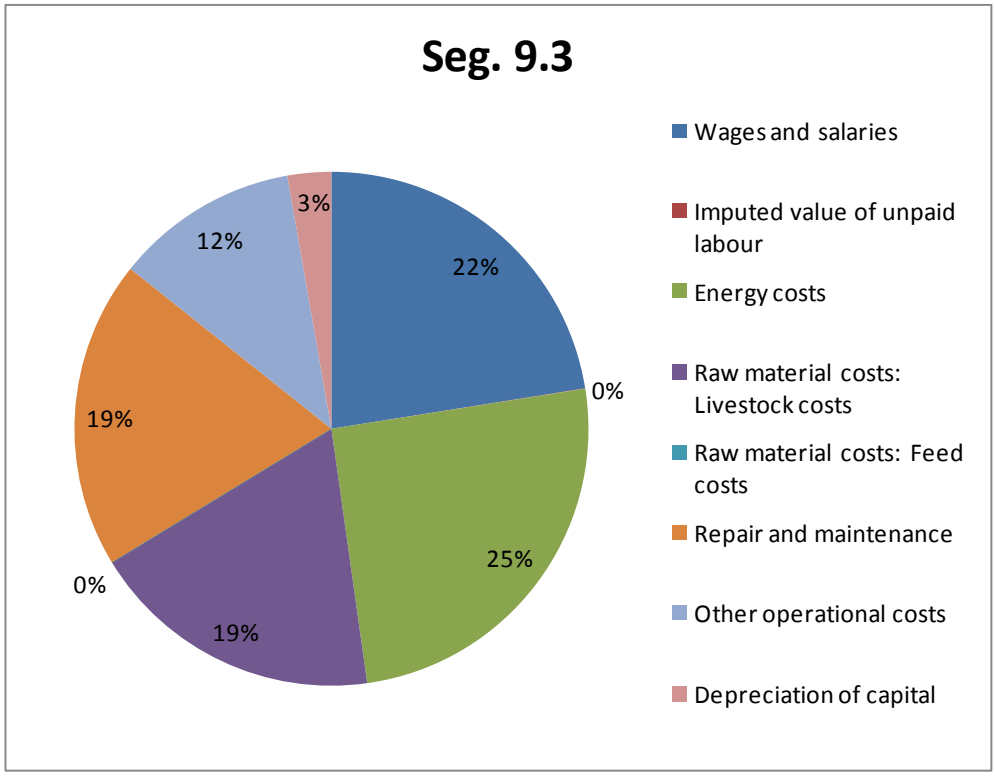
Figure 7.11.5: Operational costs structure for mussel long-line: Italy



Segment 7.2: Mussel farming is characterized by a wide diffusion of installations which use technology suitable to the exploitation of waters in the open sea. This technological opportunity has favoured the development of production all along Italian coasts and in 2009 the total turnover of the segment reached 14.4 million Euros for a gross sales volume of 12 thousand tonnes and the average price is 1.2 €/kg. The total employees was 330; in terms of efficiency in labour capacity, it's possible noted a low degree of efficiency, that is expressed by the value of around 18,000 Euros per employees (GVA/employees). Many co-operatives, bringing together individual producers, are shown to operate in the sector. In this context the labour cost is the main item in the operations cost structure. In fact, this represents 33 % of operational costs. The activity therefore shows the characteristics of a labour-intensive structure where other costs have a marginal bearing. The most important among these is the cost of buying seeds to "embed" along the rows of long-line, which represents 17 % of operational costs. After the high price of gasoline, the cost of energy represents the second item in terms of weight, with 30 % of the total operational costs. The companies have limited financial autonomy and thus the economic

balance of management results as precarious. The situation is made worse by a negative performance of the running costs on the turnover: more than 93 % of turnover is absorbed by direct cost of production, and, consequently, a level of financial costs increased and absorbs the gain from investments.

Figure 7.11.6: Operational costs structure for clam bottom: Italy



Segment 9.3: *Ruditapes decussatus* productions show marked decrease. In the last year the data were probably overestimated because an incorrect interpretation of commercial name, that is the same in Italy as for *R. philippinarum*. A part of *R. philippinarum* production was most probably considered as *R. decussatus*. *Ruditapes philippinarum* production shows a marked increase. Differences between marine and brackish water production belong to different definition of those two environments in 2008 and 2009. All the lagoon environments have been considered as brackish water, for the frequent variation of salinity for freshwater inflow.

The production segment Clams-on-bottom reaches a total turnover of 43.4 million Euros and is characterized by the predominant presence of co-operatives which manage state areas obtained through grants. The management of structure of the segment has developed through the introduction of a self-governing system which has strengthened the co-ordinating role of the co-operatives. In this context the production activity is built around a rational programme of self-management of fishing resources where the companies establish days where a minimum quota of resources is harvested, the minimum size of clams. the equipment allowed as well as the procedure for safety and quality control.

The co-operatives are made up of members/producers whose cost of labour represents the second most important accounting item in the operational costs structure, after cost of energy (which are influenced by exogenous and market aspects). In fact the cost of labour accounts for 22 % and is represented by the product quota conferred by the members/producers to the co-operative responsible for the commercialization. The livestock costs, that are around 19 % of operational costs, are represented by the transfer from nursery areas given to co-operative according property rights, to the on growing areas. Normally the cost of feeds are absent, but in the present analysis are around 3 % on the total production costs. The profitability of the investments is high, more than 55 % and the optimization of labour is higher than the other shellfish segment: with a total of 1,074 employees, the productivity of human resource is more 26,000 Euros per employee. The capital efficiency is positive (0.98) in a segment which is not capital intensive, where a low investment guarantees a maximisation of profitability. The optimization of management planning activities is linked by the percentage of running costs on the turnover: around 50 %.

7.11.3. Trends and triggers

The aquaculture sector in Italy is today managed by General Directorate of Fisheries and Aquaculture of the Ministry of Agricultural Policies and covers production from inland waters, sea and brackish environments, whereas previously this General Directorate was responsible only for the sea and brackish environments.

Actually, Italian aquaculture reveals market problems and environmental constraints. The sector has not completely utilized development opportunities, due to a lacking of an European investment planning in relation to market dynamics. Aquaculture legislation, like Fishery Law, is a composite law, which consists of different regulations drawn from civil, administrative, and community laws. In Italy, both fresh water and marine aquaculture are considered farming activities. A survey on the legal aspects that limit the development of aquaculture necessarily entails a close examination of the main juridical issues pertaining to the control of coastal areas. Indeed, fish farming plants should positively adapt to the natural cycle of water resources. The relevant legal aspects are linked to the presence of Environmental Regulations, to the complexity of the rules concerning State Concessions (licensing), as well as to the difficulties encountered in the course of the implementation and enforcement of International Sanitary Regulations.

On the hand of the new species in national production, some marine species in the statistical grouping “Other Fish” are typical of the development phase of new types of farming. Among them, white bream represent a production reality which, following an experimental stage, has developed a considerably consolidated production niche. Similarly, in the group of innovative species, umbrine farming, which reached a production of 300 tons in 2008 (EUROSTAT), is to be noted. For both species controlled reproduction techniques are available which are sufficiently reliable to provide an adequate supply of fry in relation to market demand for consumption size. Production is essentially carried out both in tanks on land and cages at sea.

Among the so-called innovative species, flat fish and tuna also need to be considered. As regards flat fish, the benchmark species are turbot and sole, for which farming experience in Italy is limited to experimentation. In particular, as regards the reproduction and early stage of raising sole (*Solea solea*), a sufficiently reliable technique has been perfected for the production of fry and the subsequent farming phases to commercial size are in the advanced stage of experimentation. For tuna fattening it’s not available a time series of the performance of the segment, mainly because the “reared” activity is strongly dependence by “quotas” available in catches sectors. Tuna farming is basically tied to the availability of wild fish caught when small or medium- sized. These are then stocked and reared in large cages (several million cubic metres), for short periods (2 - 6/7 months), until a suitable commercial size is reached, to then be

put on the market when the fished wild tuna product is not available. The limits which directly influence the development of tuna farming are represented, on one hand, by the choice of the site of the installation and, on the other, by the difficulty of producing artificial feed. Further indirect restrictions to the development of tuna farming are related to the negative impact on economic activities, like tourism and maritime traffic (navigation), in the same marine areas. In any case the Italian experience in tuna fattening showed that it is high profitability activity, capital intensive and with high performance of labour capacity.

At national level it is important to consider also freshwater macro segment, that are characterised by massive production, where the demand of the market, according to new pattern in consume of modern consumers, needs a value added in supply.

Some EU and National subsidies support the processing industry linked with primary production, as far as aquaculture sector. In the trout segment there are excellent examples of processed big size cultured freshwater fish; all those activities have facilitated the vertical integration of aquaculture sector. For massive production, the added value in terms of intangible goods/value, represents a new trend in the Italian market. For this reason, around 10 % of Italian aquaculture enterprises receive a certification of their process of production, according international rule ISO (the first semester 2011) . In addition, around of 70 % of the actives companies, are involved in total quality certification and traceability directly managed by gross modern distribution channel. On the hand of trade, very interesting is new tendency in export of fry. The most important fry producers have intensified the exports in extra EU Mediterranean Countries, because they pay by “letters of credit” and give more financial guarantees.

In forecast analysis, in the 2010-2011 the production of fish (freshwater and marine), will be a increase, and for some freshwater species (mainly trout and sturgeon) will be open new markets as organic and collective restoration (child-school, hospital, canteen, etc). For clams and mussels the performance in terms of gross sales volume depends to the agreement and to the annual planning of the co-operative and consortium with their associates and in absence of disease and pathology for the stocked nursery.

7.11.4. Data coverage and Data Quality

The segmentation of the population of the DCF is based on the elaboration of data from a census which considered all installations present in all companies which in some way are involved in the aquaculture sector. The sample size for the stratified universe (as is that of the set of fish farms) has been determined using the Bethel algorithm. It is currently the procedure adopted by the Italian National Statistical Institute which has developed a specific software. Many other Statistical Institutes have used the Bethel algorithm to solve the problem of sample allocation in multivariate surveys. The criteria of the coefficient of variation, that is to say the variability of the phenomenon being studied, is the most important criteria in determining the quality of the survey. The higher that variability is (that is to say, the standard deviation), the greater the sample size must be to obtain a pre-determined level of coefficient of variation. The sampling error is reduced by setting the sample to certain levels that ensure a certain precision of the estimate. In order to solve the problem, the data is obtained through the Bethel criterion (1989), which is a generalization for a stratified sample of the Neyman criterion. This means that for every strata (main farming technique and species), the number of sampling units required to obtain estimates, with a given level of the coefficient of variation, has been calculated (in this case, 10 % for the volume and value of production for the main species).

Software for calculating the sample size can be downloaded freely from the website of the National Statistics Institute of Italy (ISTAT).

According the segmentation adopted in Italian DCF, some information related to nursery and hatchery are generic, because is not include the specific segment. In terms of high technology and high capital investments, this segment represents a strength of Italian industry, mainly for the fry of sea bass, sea bream and the other innovative marine species.

Some inconsistency in economic data presented in the present report.
Difference with other official source are noted. Follow the difference for each segment considered in the report, in general for the segments:

- Sea bass & Sea bream on growing (seg3.2)
- Sea bass & Sea bream combined (seg3.3)

- Sea bass & Sea bream cages (seg3.4)

Some observation have been reported for the followed segments: Segment 3.2: the turnover declared in DCF is 460 thousand Euros. This value is strongly underestimated, if it compares to EUROSTAT data (volume and average price, Value) of those two species (sea bass and sea bream) in the referring year 2009. According the data shows in Table 7.11.2, the turnover is related to 228 tonnes sales, with average price of around 2 Euro/kg, that is lower rather than the common average price ex farm for those species. For the Segment 3.3 the total performance of the segment "combined sea bream and sea bass" is positive in terms of profit and ROI, but the quantities in Volume and Value reported are under-estimated: all this segment, according DCF, are 100 tonnes and around 16 million Euros for the turnover. This segment represents one of the most "performed" in terms of volume and profitability, because it includes also a high added value of internal nursery and hatchery. Referring Segment 3.4, the volume declared in DCF are no more of 940 tonnes, too much low considering the volume per cubic meter of carrying capacity of the cages.

- Segment 7.2: Mussel long line. According the EUROSTAT database the national production of mussels are, in 2008 around 76,277 and in 2009 60,982 and average price is around of 0.7 Euro/kg. In DCF the data shows a total production of 12 thousand tonnes for total turnover of 14.4 million Euros.
- Segment 9.3: Clams on bottom. According the EUROSTAT database the national production of clams are, in 2008 around 28,612 and in 2009 34,225 , in DCF the data shows a total production of 14.5 thousand tonnes for total turnover of 45.4 million Euros.

Added observation refers to the inconsistent uploaded data, transmitted for DCF purposes (comparing the performance between 2008-2009). Data quality is questionable because, according to DCF data, in the year 2009, in terms of total volume of sales, the increase registered was around 0.3 % while that for turnover amounted to over 40 %. In terms of employees, the wage and salary in 2009 strongly decreased, but the total number of employees increased more than 50 %. An important grey area in the DCF is represented by "unpaid labour" and the harmonization in the estimation of full time equivalent (FTE): two important items that have strong relevance in socio-economic analysis.

The “volume of livestock” in the 2009 was around 12,090 tonnes, which corresponds to more than 1.8 billions reared fingerling. Furthermore the costs for livestock which is equivalent to the average price per fingerling is less than 0.07 Euro. This is a questionable price in the Italian market.

In terms of data quality, it may be beneficial to push for a specific discussion regarding; debts, depreciation, energy, unpaid labour, FTE calculation, etc.

7.12. LATVIA

7.12.1. Overview of the sector

Aquaculture production in Latvia is relatively small. All aquaculture production comes from freshwater environments. In 2009, there were produced 517 tonnes (live weight), almost all of them were freshwater fishes. The main species bred are carps, catfish, sturgeon, pike and trout (FAO, EUROSTAT).

A large number of aquaculture companies focus on angling tourism. Also many agricultural companies have entered aquaculture as a complement to their core businesses in agriculture. This investments were encouraged by the availability of support from the special EU programme of pre-accession measures, of which diversification of rural economy was a priority measure in 2002-2003.

Both, EUROSTAT and FAO data on the Aquaculture production in quantities match pretty well. Moreover, FAO also provides data on the value of the production, as can be seen on table 7.12.1.

Table 7.12.1: Aquaculture production in 2008-2009 (quantities and values): Latvia

	Quantity (t)		Value (000 EUR)	
	2008	2009	2008	2009
Crustacea	<0.5	0.1	<0.5	2
Pisces	584	517.1	1514	1120
Total	584	517.2	1514	1122

Source: FAO FishStat Plus and exchange rate from Eurostat

7.12.2. Data coverage and Data Quality

Latvia submitted no data for the DCF aquaculture data call, since, in the DCF the collection of fresh water species is not mandatory[1]. FAO FishStat Plus classifies all Latvian aquaculture as freshwater; Eurostat data confirms that Latvian aquaculture is “inland”.

Moreover, Commission Decision 2008/949/EC specifies that DCF data should be collected from enterprises whose primary activity is defined according EUROSTAT definition under NACE code 05.02: ‘Fish Farming’. However, the fact that agricultural companies do aquaculture as a complement to their core businesses, and even when aquaculture companies focus on angling tourism (they could obtain a higher income from the angling activity) can reduce the population subjected to provide data for the DCF data collection.

EUROSTAT and FAO data on the aquaculture production in quantities for 2008 and 2009 match pretty well.

There is no country data for Latvia on the National Aquaculture Sector Overview (NASO) from FAO.

[1] Section A of the Chapter IV of the Commission Decision 2008/949/EC of the 6th of November 2008, on Adopting a multiannual Community programme pursuant to Council Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy.

7.13. LITHUANIA

7.13.1. Overview of the sector

Lithuanian freshwater aquaculture mainly consists of pond farms which are predominating compared to other technologies. The main aquaculture producers are private enterprises which exploit ponds on average size of 500 ha (from 100 to 1000 ha). Aquaculture farms cultivate about 11 different freshwater species; however, carp production is prevailing and composes 94 %-97 % of produced fish volume.

The number of pond farms in Lithuanian aquaculture sector was 19 in 2010. Number of aquaculture companies, which exploit ponds during recent years remained stable, whereas the number of enterprises which use recirculation systems has a tendency to increase. According to the Veterinary service register, there were 35 enterprises certified to cultivate fish in 2011. The development of modern aquaculture systems and introduction of new fish species was one of the strategic goals in aquaculture development and priorities induced by European Fisheries Fund support.

Considering the fact that pond aquaculture during 2009-2010 remained constant, the employment trends were stable as well and during period of 2009-2010 increased by 2 % to 348 persons. A slight expansion of the number of enterprises exploiting recirculation systems resulted in the higher number of persons employed in aquaculture sector.

The volume of aquaculture sector in 2010 was 3190 tons with the value of 6.1 million Euros. Compare to 2009, volume and value of the sector declined by 6.8 % and 8.4 % respectively. Despite the decrease of aquaculture production in 2010, the exploited area of ponds increased 1.56 % to 8545.8 ha.

Lithuanian aquaculture sector mainly consist of one segment – land based carp on growing (segment 4.2). Carps are cultivated in ponds and about 8 enterprises from 19 acquire hatcheries

so technique in some cases could be attributed to combined segment. This segment represents around 94 % of total aquaculture production, the rest part of enterprises use different techniques as recirculation systems as well as tanks and raceways for cultivation of other species, for instance eel in the recirculation system. There are also 6 state owned aquaculture units, which mostly produce fish for restocking purpose and are not participating in the market.

Table 7.13.1: Economic Performance at national level: Lithuania

	2008	2009	2010	Change 2010/2009 (%)
Number of enterprises	20	21	21	0
Total sales volume (tons)	3008	3421	3190	-6.8
Turnover (1000 Euros)	6642	6628	6069	-8.4
Number of persons employed	340	341	348	2.1

There were 2936.4 tons of carps produced in 2010 and compare to 2009, the volume decreased by 8.9 %. Carp price during the same period slightly increased by 2.4 % to 1.84 Euros/kg. During the 2007-2010 period carp prices had a decreasing trend following by fluctuating trendless tendency of production volumes. The total sale value of carps in 2010 amounted 5.4 million Euros.

Another fresh water species which was common among aquaculture farms was northern pike. Special interest to northern pike was raised in 2010, when production volume jumped around six times from 18 tons to 106 tons compare to 2009, whereas the price decreased by 34 % from 3.04 Euros/kg in 2009 to 2.0 Euros/kg.

Special attention could be made on the development of highly valuable fish species as trout and sturgeons sector. The production volume of sturgeons during the 2005-2010 period increased from 5 tons to 17.2 tons. The price of sturgeons from 2005 till 2009 remained stable at 6.8 Euros/kg level, however, dropped by 17 % in 2010 to 5.7 Euros/kg. The volume of trout

production in Lithuanian aquaculture farms during the analyzed 2005-2010 period has a peak in 2008 and from that point declined by 57.4 % from 80 tons in 2008 to 34.1 tons in 2010. Price of trout has a similar trend and during that period declined 12.8 % to 3.19 Euros/kg. The recent decrease in prices was mostly influenced by the general economic conditions and reduced consumption; however, the sturgeon price was also affected by the increase of supply and market size limitation.

The total costs of aquaculture production in 2010 were 4.9 million Euros, comparing to 2009 it decreased by 7.9 %, whereas turnover declined 8.4 % from 6.6 million Euros in 2009 to 6.1 million Euros in 2010. Aquaculture sector in 2010 was profitable and amounted 1.2 million Euros – slightly lower than in 2009 (1.3 million Euros)[1].

The biggest share in aquaculture cost structure in 2008 was attributed to the feed and personnel[2] costs, 40.5 % and 22.4 % respectively. As far as Lithuanian aquaculture farms are differently supplied by breeding material, the costs are fluctuating significantly. These farms which possess a hatcheries, spend about 6 % of costs for breeding material, whereas others, which purchase it needs almost 39 % of costs. Concerning the rest important items in cost structure, around 9% goes for energy, 2.5 % for repair and maintenance, 1.7 % for fertilizers and 7.7 % for other costs. Capital depreciation was accounted for 9.4 % of the total costs[3].

Table 7.13.2: Main segments and economic indicators in 2010: Lithuania

Techniques	Seg 4.2
Species	Carps
Environment	Freshwater
Number of enterprises	19
Total sales volume t	2936.4
Turnover, 1000 Euros	5400

[1] Data provided for the experts by National Association of Aquaculture and Producers of Fish Products
[2] Does not include imputed value of unpaid labor, however most of enterprises are joint-stock companies and not family business.
[3] O. Eicaite, D. Juskeviciene Akvakultūros ūkių ekonominio dydžio, išreikšto Europinio dydžio vienetais, nustatymas, Management theory and studies for rural business and infrastructure development. 2010 Nr. 22(3).

7.13.2. Trends and triggers

Lithuania has quite long practice in organic aquaculture. The first 10 aquaculture farms was certified in 2003 and since then organic aquaculture was spreading rapidly among the aquaculture enterprises in 2003-2005 when become more or less stable. Organic aquaculture production accounted around 40%-55 % of total aquaculture production in 2008-2010[4]. The peak of growth of this kind of fish production was observed in 2009, when total area of certified ponds reached 5,9 ha, total organic fish production - 1900, and it was 70 % of total used fish ponds and 55.5 % of total aquaculture fish production in the ponds. However, the reduction of 31.5 % of volume of marketable fish was observed in 2010, when the volume of sold fish was 1300 t. During that year the total capacity of organic ponds reduced by 10 % and reached 5275 ha. This situation is partly explained by the reduction of support for organic fish production and absence of specific market where premiums for organic production could be collected. There are 10 organic aquaculture producers certified at the moment in Lithuania and 5 more are under transitional period[5].

Despite of growing interest in organic production in the EU, organic carps are not very popular and usually sold with conventional production in Lithuania. This situation could be explained by fresh fish market, which is not equipped to separate live organic fish from the others, there is no organic labelling for fish products either. Carps are also quite cheap fish with a lot of bones and consumers are not ready to pay extra for such fish, even if it is organic. Consumers also prefer other fish species coming from aquaculture, as salmon and trout. There were no specific studies or market research in this area in the country at the moment so these kinds of products are still seeking for its niche and consumer.

All main aquaculture producers, raising carps in ponds prepared and approved Aqua-environmental management plans, which are funded by European Fisheries Funds II priority axis Aquaculture, inland fishing, processing and marketing of fishery and aquaculture products Aqua-environmental measures. This includes measures to promote ecological and sustainable aquaculture, participation in Community eco-management and audit scheme, forms of

[4] V. Vaikutis, *Inland fishery,* Agriculture and food sector in Lithuania 2010, LIAE, Vilnius, 2010 (in Lithuanian)
[5] Data from the Certifying authority (Ecoagros)

aquaculture, covering the environment, natural resources, genetic diversity, landscape protection and enhancement. Implementation of these measures is important for environment, as most of ponds are attracting a lot of water birds, which are building the nests around. Some ponds in Lithuania are established in the NATURA 2000 area and aquaculture producers are compatible with specific environmental constraints. Aqua-environmental measures are planned for 5 years and should be implemented by enterprises till 2013, the total EFF and national support for the measures is 7.8 million Euros. There were 21 application for support of which 19 been granted[6].

First recirculation systems appeared in Lithuania in 1986 when experimental fish cultivation in recirculation systems department was established in Mechanization and electrification institutes training base. First attempts to cultivate fish in recirculation systems was made afterwards, however the operating costs were very high to cultivate carps and the production was stopped. However this type of technology becomes more and more popular for production of valuable fish species as sturgeon, trout and eel in the existing enterprises recently.

The rules of EFF support are also giving an opportunity to appear new aquaculture enterprises in the sector. At the moment there are about 7 projects, intended to invest in new production technologies and recirculation systems approved for EFF support. There were also 2 practical training and consultation centres, specialising in raising sturgeon and catfish in the recirculation systems established and supported through collective action measure of EFF. These initiatives are quite important for the aquaculture development, attracting and training new people in the sector. At the moment it is early to evaluate the results of recent developments, however we can forecast the rise of production of valuable fish species, complementing and replacing traditional carp aquaculture in the future.

7.13.3. Data coverage and Data Quality

Lithuania is not obliged to collect the aquaculture data under the DCF, because of the freshwater nature of the companies in Lithuania. The analysis was based on the expert knowledge and the data collected for national and FAO purposes. The data completely represent the main segment

[6] Data from National Paying Agency under the Ministry of Agriculture.

and involve the largest aquaculture producers. The data source was State enterprise Agro-information and Rural Business Centre and National association of aquaculture and producers of fish products as well as other data sources and publications listed in the text.

7.14. MALTA

7.14.1. Overview of the sector

Malta is strategically placed in the centre of the Mediterranean Sea with excellent climate conditions for aquaculture, giving Malta an advantage over other European countries that experience a colder climate. The number of aquaculture companies during the year 2009 amounted to 6 companies. In total, the companies employed 173 employees, of which 167 were male. The number of total full-time equivalent amounted to 145 of which 141 were male full-time equivalents. Other jobs are indirectly generated and are mainly concentrated in the wholesale and retail trade, transport and communication, financial intermediation and manufacturing sectors. The total sales volume for the year 2009 amounted more than 6,000 tonnes corresponding to a value of almost 48 million EUR (see Table 7.14.1 for more details).

The two main segments are the Closed Cycle Species (European sea bass and gilthead sea bream farming) and the Capture Based Atlantic bluefin tuna farming or tuna penning as it is more commonly known. All fish farmed in Malta are reared in floating sea cages.

For the Closed Cycle Species various cages are used. Fusion Marine and Corelsa cages are used in offshore sites, while Floatex cages are used in inshore nursery sites. Nursery cages usually measure 5x5x5 m or 10 m deep, whereas offshore cages are 15x15x5 m or 20 m diameter x 10 m deep.

In the case of bluefin tuna, large cages with a diameter of 50 m and depth of 30 metres are usually used. A few 90 m diameter cages have also been used since 2003. The 50 m diameter cages are Spanish, Italian or English offshore cages which are moored in waters ranging from 50 to 90 m deep at a distance of 1 to 2 kilometres or 6 km off the coastline. The tuna farming technology used in Malta is similar to that of other Mediterranean countries, namely Spain, Croatia, Turkey and Italy. Generally, fish are caught in international waters and are then

transferred to the cages where they are fed. The fish are kept in the cages until they are harvested and exported.

Table 7.14.1: Economic Performance at national level: Malta

variable	Unit	2008	2009	% Change
Number of enterprises	NUMBER	6	6	0
Total sales volume	TONNE	6700	6300	-6
Turnover	000 EURO	94000	48000	-50
FTE	NUMBER	169	145	-15
Gross Added Value	000 EURO	25000	-22000	-190
Earnings Before Interest and Tax	000 EURO	13000	-36000	-375
Return of investments	%	65	-200	-405
Subsidies	000 EURO	117	89	-25
Labour productivity	000 €/FTE	150	-150	-200
Capital productivity	%	135	-125	-190

Due to confidentiality issues data has been rounded

During the year 2009 the total sales volume was 6 % less the amount recorded for the year 2008. This amount of sales volume generated a turnover of almost 48 million Euros, which is equivalent to around 50 % less than the turnover generated during the year 2008.

In gross-value added terms, the above mentioned results coupled with higher costs during the year 2009 resulted in a negative change of around 190 % when compared to the year 2008. Additionally, the earnings before interest and tax also resulted in a negative change of more than 375 %. This is a result of the negative change in terms of the gross-value added and the higher depreciation of capital experienced during the year 2009. Labour costs (wages and salaries and the imputed value of un-paid labour) have remained stable during the two years and therefore did not affect the negative change experienced in terms of the earnings before interest and tax.

The return on investment amounted to less than -200 % and is due to a large negative percentage change when compared to the year 2008. This is a consequence of the negative change in the earnings before interest and tax and also the decrease in the total value of assets when compared to the previous year. The negative values and changes experienced in terms of the gross value added also resulted in negative values for labour and capital productivity amounting around -150

thousand Euros per FTE and -125 %, respectively. These values represent a negative change of around 200 % respectively in relation to the year 2008.

The Maltese aquaculture sector is highly characterised by Atlantic bluefin tuna farming. During the year 2009, farmed bluefin tuna accounted for around 85 % of the total turnover and for around 65 % of the total sales volume. The decrease in the price of bluefin tuna was the main reason behind this economic downturn in the aquaculture sector during the year 2009. The latter resulted due to an over-supply in the year 2008 as a consequence of a lower demand from Asian markets due to the recession. For this reason, net investments in the year 2009 were also affected negatively, being reduced by around the 80 % from the previous year.

Figure 7.14.1: Employment and average annual salary: Malta

During the year 2009, the number of full-time equivalent amounted to 145, resulting in a decrease of 14.2 % when compared to the previous year. The mean wage per full-time equivalent amounted to around 25,000 Euros. This result implies a 5 % increase when compared to the year 2008. The economic downturn in the aquaculture sector during the year 2009 did not have a major negative social effect in the short term, as the average wage per full-time equivalent increased while employment slightly decreased.

7.14.2. Structure and economic performance of the sector's main segments

The sector's two main segments are the sea bass and sea bream cages (segment 3.4) and other marine fish cages (segment 6.4). Only one company makes part of the sea bass and sea bream cages segment (segment 3.4). Apart from the culture of European sea bass and gilthead sea bream, this company also cultures Meagre. Gilthead sea bream is considered to be the most important specie as it accounts for 72 % and 81 % of the segment's total value and volume of sales respectively. The second most important specie is European sea bass as it accounts for 21 % and 11 % of the value and volume of sales respectively. Meagre only represents 8 % for both the volume and value of sales.

European sea bass and gilthead sea bream commercial farming is characterised by a process whereby 2g fingerlings are placed in sea cages and fed on dry pellets that are imported from Europe. The fish are fattened until they reach a market size of 350-450g, when they are harvested for export to European markets, mainly Italy.

The other 5 companies all make part of the other marine fish cages segment (segment 6.4). The companies in this segment mainly culture Atlantic bluefin tuna however other cultured species include gilthead sea bream and amberjack. Bluefin tuna accounts for 92 % and 78 % of the segment's total value and volume of sales respectively. Sea bream accounts for 8 % and 22 % of the total value and volume of sales respectively, while Amberjack accounts for a low value and volume of sales which is equal to 0.04 % and 0.06 % respectively.

As explained above, the segment for other marine fish cages (segment 6.4) is highly characterised by capture based bluefin tuna farming (or Tuna penning). This is carried out in 50m diameter off shore floating cages. Generally, fish are caught in International waters by purse-seine fishing during the month of June and kept in cages where they are fed until they are harvested and exported to Asian markets (mainly Japan) between October and January, by which time they would have increased their body weight by about 10 %. The size of the exported fish depends on the size of fish caught from the wild and generally ranges between 80 and 620 kg.

Table 7.14.2: Main segments and economic indicators: Malta

Techniques:		Cages
Species:		Atlantic Bluefin tuna, Gilthead sea bream and Amberjack
Environment :		Salt water
Number of enterprises	NUMBER	5
Total sales volume	TONNE	5135
Turnover	000 EURO	44004
Gross Added Value	000 EURO	-22712
EBIT	000 EURO	-36567
Return on investment	%	-214.4
FTE	NUMBER	110
Subsidies	000 EURO	89
Labour productivity	000 €/FTE	-206.5
Capital productivity	%	-133.2
Running cost to turnover ratio	%	159.0
EBIT to turnover ratio	%	-83.1

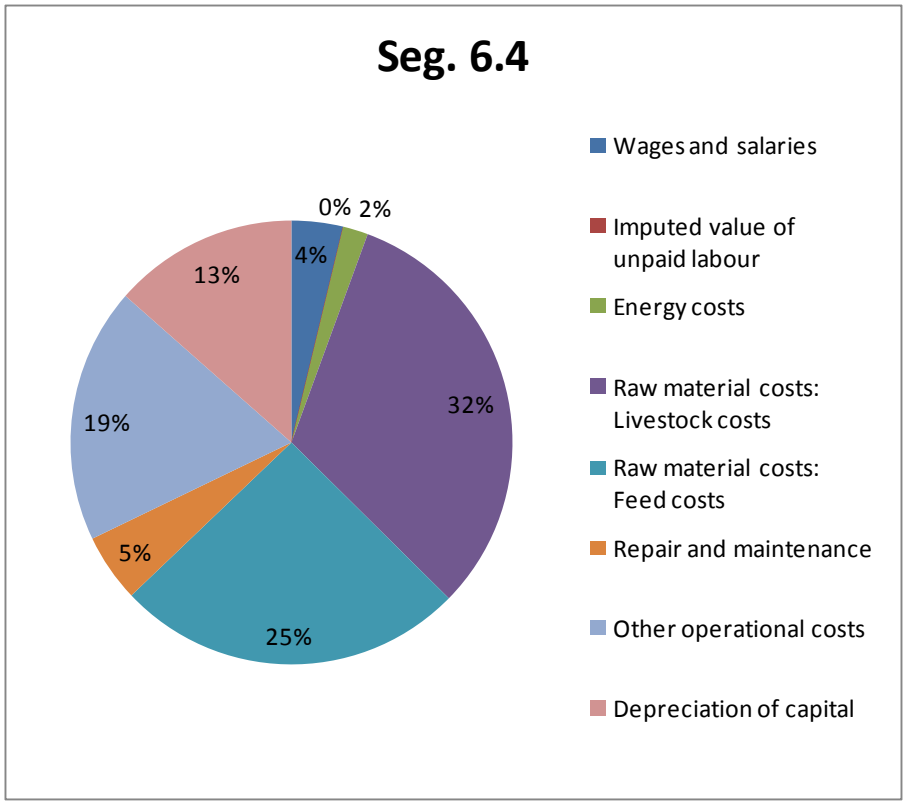
The sales volume of this segment (Other marine fish cages – segment 6.4) amounts to 5,135 tonnes. This accounts for 81 % of the sector's total sales volume. The corresponding value amounts to 44 million Euros and accounts for 92 % of the sector's total turnover.

Gross value added for this segment amounts to more than -22 million Euros, which is in part a result of the decreased turnover experienced during the year 2009. Turnover for this segment decreased by 51 % when compared to the previous year. As a consequence, the value for the earnings before interest and tax is also negative and amounts to more than -36 million Euros. Another reason for such a result is the change in the depreciation of capital which is 26 % higher when compared to the year 2008.

The return on investment amounted to -214 %. This is due to the negative value for the earnings before interest and tax. The negative values and changes experienced in terms of the gross value added also resulted in negative values for labour and capital productivity amounting to -206 thousand Euros per FTE and -133 % respectively. The running cost to turnover ratio is equal to

159 % and shows that the running costs are substantially higher in relation to the turnover during the year 2009. Again, this is a consequence of the large decrease in turnover in relation to the previous year.

Figure 7.14.2: Operational costs structure for Atlantic bluefin tuna and others finfish species in cages: Malta



Live stock costs are the highest costs incurred by the sector and amount to 32 % of the total operational costs. These costs have more or less remained stable during the years 2008 and 2009. Feed costs are the second highest costs incurred by the sector and amount to 25 % of the total operational costs. In this case, there has been a 30 % increase when compared to the year 2008. Possible reasons for such an increase could be that the fish caught during the year 2009 were smaller and therefore needed to feed much more and secondly the price of bait and dry feed for sea bass and sea bream may have risen during the year. Raw material costs account for more than 50 % of the total costs.

The lowest costs incurred by the sector are energy costs and wages and salaries, which amount to 2 % and 4 % of the total operational costs respectively. The reason for low energy costs is related to the fact that these costs are mainly incurred by the vessels which feed the cultured tuna on site and do not include the energy costs related to the capture of the tuna from the wild which results in a larger consumption of fuel. The latter would be part of the fleet expenditure.

7.14.3. Trends and triggers

In Mediterranean aquaculture there is a need for species diversification to create a more varied market for aquaculture products. Diversification is essential to produce and maintain a variety of marine species for the market. Apart from the highly priced bluefin tuna, there are quite a few species that are excellent candidates for Maltese aquaculture, such as the amberjack. This fish is a fast grower and fetches a good price on the market; however egg production on a commercial scale is the present bottleneck in this region.

Malta is at the forefront of amberjack and bluefin tuna research for the development of sustainable aquaculture for these two species. The production technology for rearing amberjack juveniles is overcome but requires more work before commercialisation. In the case of bluefin tuna fingerling production, egg production has been overcome and fingerling production is on an experimental level within the EU 7th Framework Program SELFDOTT. Other candidate species that are also considered for future research are the grouper (*Epinephelus guaza*), the common dentex (*Dentex dentex*), the red porgy (*Pagrus pagrus*) and wreckfish (*Polyprion americanus*).

7.14.4. Data coverage and Data Quality

During the year 2009 the aquaculture sector comprised of only 6 companies, a census was conducted to collect the data required. Direct interviews based on questionnaires were used to gather all the data needed and company accounts were used as data sources. The response rate was equal to 100 %. For these reasons, the data is considered to be of high quality.

Due to the small market size in terms of number of companies, data confidentiality can be an issue. Since one of the two main segments (Sea bass and sea bream cages - segment 3.4) is made up of one company, only data with regards to the other main segment (Other marine fish cages – segment 6.4) made up of 5 companies has been presented and commented upon in this chapter.

7.15. NETHERLANDS

7.15.1. Overview of the sector

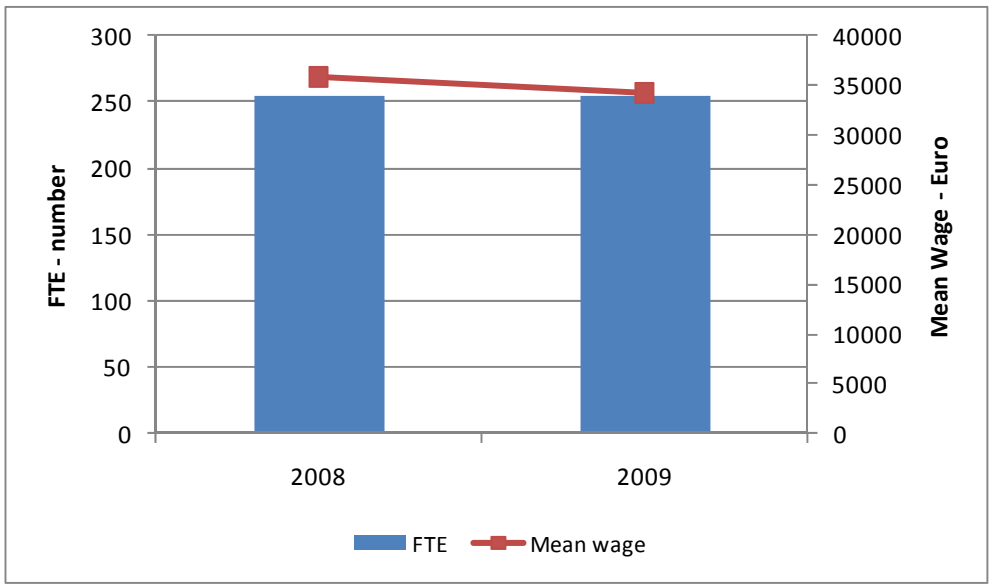
The aquaculture sector in the Netherlands (for consumption fish) is small compared to the fisheries sector. Total gross output from the Dutch aquaculture sector in 2009 was 62.3 million Euro. The total aquaculture sector consisted of about 75 companies and employed around 250 FTE. The majority of the companies are located in the South-west part and are involved in the culture of shellfish. Some freshwater fish culture occurs spread out over the rest of the Netherlands. These are however not taken into account in the statistics presented here.

Table 7.15.1: Economic Performance at national level: The Netherlands

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER			
Total sales volume	TONNE	46000	46000	0.0
Turnover	000 EURO	71147	62336	-12.4
FTE	NUMBER	255	255	0.0
Gross Added Value	000 EURO	55000	40273	-26.8
EBIT	000 EURO	41849	24799	-40.7
Return on investment	%	18.7	12.7	-32.2
Subsidies	000 EURO	0	0	
Labour productivity	000 €/FTE	215.7	157.9	-26.8
Capital productivity	%	24.6	20.6	-16.2

The economic results of the whole aquaculture sector in the Netherlands depend primarily on the developments in the mussel sector, which is by far the most important within Dutch aquaculture. This segment is the most profitable part of the primary seafood industry in the Netherlands with a positive Gross Added Value and considerable returns on investments. Due to a decrease in the price of mussels the turnover of the sector decreased substantially in 2009. This also caused decreases in all other economic indicators. Wages decreased as well, but the decrease was only limited.

Figure 7.15.1: Employment and average annual salary: The Netherlands



7.15.2. Structure and economic performance of the sector's main segments

The Dutch aquaculture sector consists of three main segments:

- Mussel culture: Concentrated in Zeeland and the Wadden area this is the biggest sector within Dutch aquaculture. Around 50 companies are actively involved, producing around 50 million kg of mussels annually during the last years. However, the production of mussels (in tonnes) has declined quite a lot since 1996. In 1996 92,000 tons of mussels were produced. In 2009 the production was only 46,000 tons, a decline of almost 50%. One of the reasons is a shortage of spat due to environmental restrictions on the catch of wild spat and a natural shortage of spat in the areas where catches are still allowed. The mussels are grown predominantly in bottom culture. One company is involved in long line culture on a small scale.
- The culture of Flat oysters and Pacific oysters is closely connected to mussel culture. About half of the 26 companies that produce oysters also produce mussels Oysters are also grown in bottom culture. The production of oysters has recently declined considerably from between 25 – 30 million pieces per year between 2004 and 2008 to 20 million pieces in 2009.
- Beside these two sectors, aquaculture of a variety of freshwater species is also taking place in the Netherlands, with European eel, and catfish (North African catfish and Claresse) being the two most important species. Because of different reasons the number of companies and

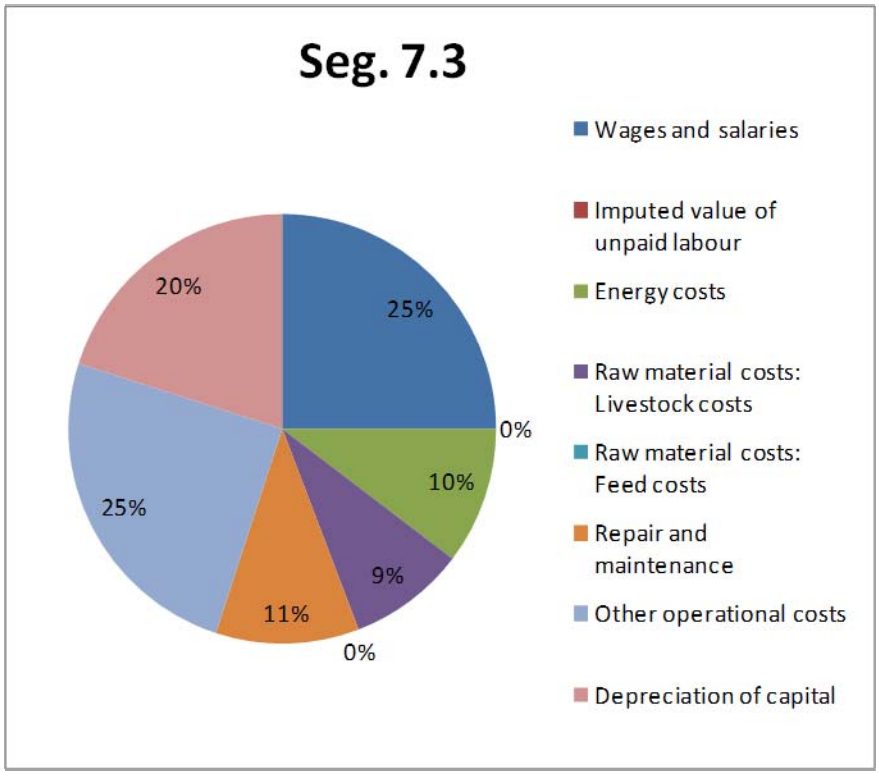
the production of both species declined steeply over the last decade. Other species which are grown by a small number of companies are trout, tilapia, carp, pikeperch, sole and turbot. Most of the Dutch fish farms are just producing one species, although at least one firm produced both European eel and North African catfish.

Table 7.15.2: Main segments and economic indicators: The Netherlands

Techniques		Bottom	Bottom
Species		Mussel	Oyster
Environment*		Saltwater	Saltwater
Number of enterprises	NUMBER		
Total sales volume	TONNE	46000	
Turnover	000 EURO	56000	6336
Gross Added Value	000 EURO	33268	7005
EBIT	000 EURO	18914	5885
Return on investment	%	10.5	38.3
FTE	NUMBER	170	85
Subsidies	000 EURO	0	0
Labour productivity	000 €/FTE	195.7	82.4
Capital productivity	%	18.5	45.6
Running cost to turnover ratio	%	45.5	43.4
EBIT to turnover ratio	%	33.8	92.9

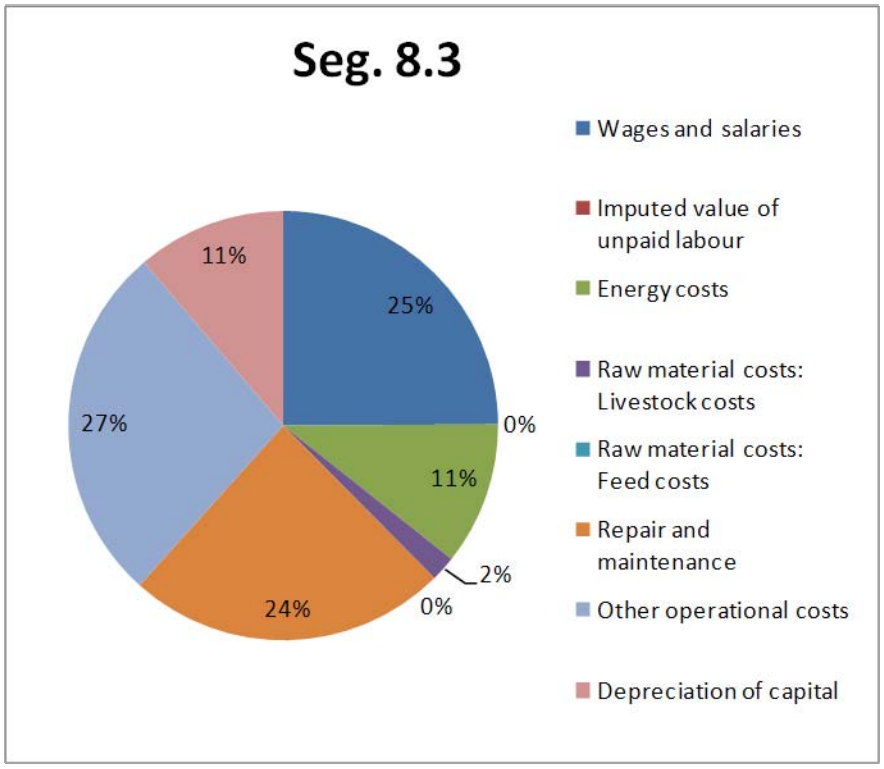
As said before, mussel culture is the most profitable segment in the Dutch fish industry. The return on investment is not extremely high, but this is also due to the substantial invested capital in this sector. Labour productivity is very high in this industrialised culture. Most important costs items include wages (25%) and depreciation costs (20%). Energy costs, repair and maintenance and the costs of spat are of lesser importance. Within other operational costs, rental costs for the area where the mussels are important.

Figure 7.15.2: Operational costs structure mussel bottom culture: The Netherlands



The Oyster industry is quite different from the mussel industry. The scale of production is lower, companies are smaller and a large part of the companies combines the culture of oysters with other activities. The capital invested in the vessels is much lower (average age around 70 years) than for the mussel sector, resulting in a higher return on investment and capital productivity, but labour productivity is much lower than in the mussel sector. Over the last years this sector has shown big variations in income due to large changes in production and prices, but in 2009 the economic revenues were in general positive. Most important costs items for the oyster sector are wages and repair and maintenance (both around 25%). Other operational costs include also for this sector the costs of lease of the growing area (approx. 8%). Depreciation costs and energy costs are of secondary importance (around 10%).

Figure 7.15.3: Operational costs structure oyster bottom culture: The Netherlands



7.15.3. Trends and triggers

As from 2009 the mussel sector has started the execution of a covenant with the Ministry of Agriculture, Nature Conservation and Food Security and nature organisations to abolish gradually the fishery for spat and replace it by mussel seed capture installations. Over the last two years a number of experimental setups have been tested for inshore installations and some of the systems will be scaled up in the coming years. Moreover the sector is looking for opportunities for of shore mussel seed capture and also of shore mussel culture. Also in the oyster sector experiments with spat capture installations have been carried out.

In land-based aquaculture the main innovation of the last years has been experiments with integrated sole production along with ragworm, shellfish and sea crops in open channels in the south west of the Netherlands.

7.15.4. Data coverage and Data Quality

In contrary to the fisheries sector, the aquaculture sector is relatively data poor. Only for the mussel culture, reliable data exist on the total production from the mussel auction in Yerseke. For other sectors the data collection solely depends on data collection from firms. In order to attain economic information from the aquaculture sector LEI makes use of a panel of companies from which the annual financial accounts are analysed. This is mainly because of high non-response of previous questionnaires in this sector. Moreover, this way of data collection ensures the proper quality of the data. For the mussel and oyster sector there are no confidentiality issues.

7.16. POLAND

7.16.1. Overview of the sector

In 2009 there were about 1,077 aquaculture land-based farms in Poland. The aquaculture farms are managed by small and medium companies or small family enterprises. The number of people employed was estimated at 5,700. The turnover amounted to 88.4 million Euros. There was a decrease of 19 % compared to the previous year. The total volume of aquaculture production was 38.8 thousand tons. Also the total sales volume of aquaculture products decreased by more than 9 % in 2009 compared to the previous year. The Polish fish aquaculture consists of traditional land-based farms and intensive fish production facilities using combine techniques. The former includes carp farming in ponds, the second – intensive grow at farm, producing mainly trout. According to the Central Office of Cartography and Geodesy the surface area of ponds was 70.1 thousand ha.

Carp farms are located all over the country but the larger facilities are located in central and southern Poland where climatic conditions are warmer and thus more advantageous. Trout farms are located in the north on the Baltic Sea coast and in southern Poland in the Carpathian foothills in rich terrain with clear, cool waters.

In 2009, carp stands for 45 % of the whole aquaculture turnover and 50 % of the total production. Trout contributes 35 % of turnover and 38 % of production and other species constitute 20 % of revenues in aquaculture and have 12 % share in production. Most of aquaculture farms produce more than one species, mainly grass carp, silver carp, bighead carp, crucian carp, pike, European catfish, tench and sturgeon. In addition to the production of fish for consumption, Polish aquaculture produced stocking material for migratory (anadromous), rheophilic and predatory fish. This material was used to stock open waters, exploited by the Polish Angling Association and other leaseholders, the Baltic Sea and rivers. As a result of stocking Polish marine, which was state funded, successful conservation programmes for salmon and sea trout were carried out. The investments in aquaculture were supported by grants under the

Operational Programme "Sustainable Development of the Fisheries Sector and Coastal Fishing Areas 2007-2013". In 2009 under Priority Axis 2 - Aquaculture, inland fishing, processing and marketing of fishery and aquaculture products the limit of funds for financing investment in aquaculture was 50.2 million Euros. Complex grant applications submitted by farmers exhausted 71.8 % of the available limit.

Table 7.16.1: Economic Performance at national level: Poland

	2008	2009	Change 2009/2008 (%)
Number of enterprises		1177	
Total sales volume t	42869	38854	-9.4
Turnover (1000 Euros)	109219	88356	-19.1
Number of persons employed		5700	

7.16.2. Structure and economic performance of the sector’s main segments

The economic performance includes only information on fish farms that breed and rear Atlantic salmon fry and cooperate with the Panel for Restocking appointed by the Minister of Agriculture and Rural Development to stocking Polish marine areas and the maintenance and conservation of diadromous fishes in the surface inland waters. In 2009, there were 7 such land-based farms. All of them apply combined fish farming techniques.

FTE employment in fish farms that breed and rear Atlantic salmon fry was 53 persons and annual average wages, including imputed value of unpaid labour, was 10,113 Euros.

Figure 7.16.1: Employment and average annual salary: Poland

Total production fish farms that breed and rear Atlantic salmon fry was 1.1 thousand tonnes of fish, 360,931 smolts items and 707,460 salmon fry items and also more than 1 million trout and whitefish stocking items. The turnover amounted to 2.88 million Euros but the share of Atlantic salmon fry was only 8.4 %.

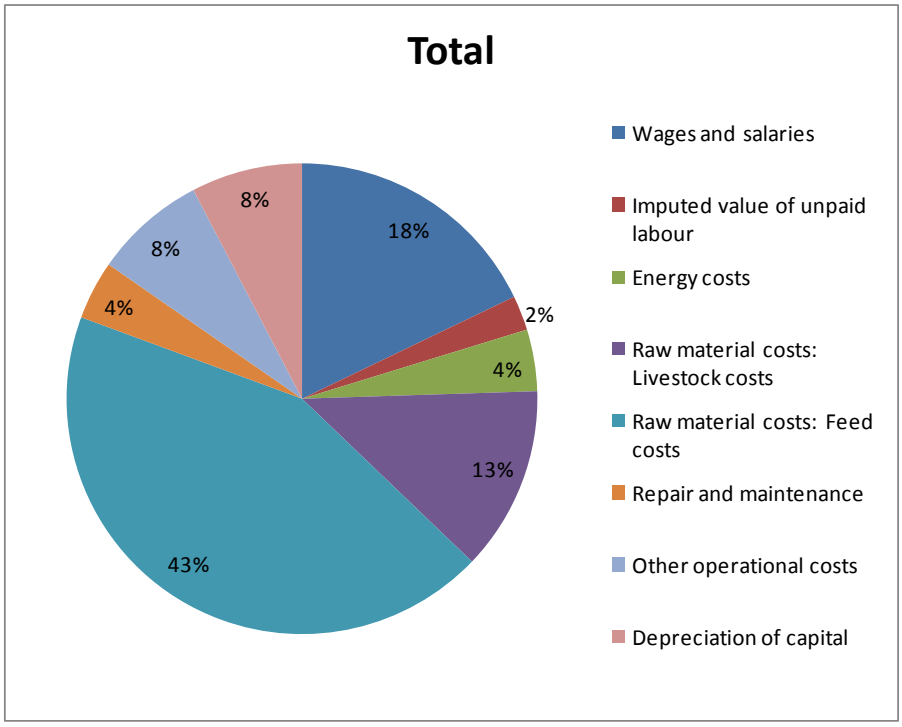
Table 7.16.2: Main segments and economic indicators: Poland

Techniques		totals
Species		Atlantic salmon/ Other freshwater
Environment*		Freshwater
Number of enterprises	NUMBER	7
Total sales volume	TONNE	1057
Turnover	000 EURO	2882
Gross Added Value	000 EURO	1005
EBIT	000 EURO	321
Return on investment	%	4.2
FTE	NUMBER	53
Subsidies	000 EURO	54
Labour productivity	000 €/FTE	19.0
Capital productivity	%	13.3
Running cost to turnover ratio	%	84.8
EBIT to turnover ratio	%	11.1

Ratio analysis shows that the condition of farms was good. The contribution of fish processing to the national economy, measured by GVA indicator, was 1.0 million Euros. The operating profit before taxes and interest (EBIT) amounted to 0.3 million Euros. Margin operating profit EBIT amounted 11.1 % and shows how much of the value of sales remains in the company after deductible expenses, excluding taxes and interest. The productivity of business assets, independent of the taxes and interest (ROI) amounted to 4.2 thousand Euros. Labour productivity, amounted to 18.9 thousand Euros per one FTE, shows that farms manage their human resources effectively. Also capital productivity, amounted to 13.3 %, shows that farms manage their assets effectively. The operating running expenses to turnover ratio amounted to 84.8 % and show the efficiency of the cost structure of analyzed farms.

The purchases of raw materials had 56 % share in the total cost structure, the feed costs had the largest share (43 %) and purchased livestock shared only 13 %. Labour costs (wages and salaries) had the 20 % share of total costs. Depreciation and other operational costs had 8 % share each, energy end repair and maintenance 4 % share each.

Figure 7.16.2: Operational costs structure: Poland



7.16.3. Trends and triggers

Restocking of the Polish maritime areas is carried out under the Fisheries Act of 19 February 2004 (Journal of Laws of 2004, No. 62, pos. 574) by the Minister of Agriculture and Rural Development and is funded annually by the state budget. Restocking Polish maritime areas shall be performed under the restocking plan. The statutory guarantee for the restocking creates good prospects for fishing farms which produce Atlantic salmon stocking material for the purpose of restocking Polish marine areas.

Carps are produced for the domestic market. Export opportunities are limited to a hundred tons per year. To reassert carp's position in the internal market five promotional carp consumption campaigns, under the common “Mister Carp” logo, were conducted in the years 2005-2009 with the support of the funds from the EU.

The growth factor which stimulates the production of rainbow trout, in addition to domestic demand, is increasing exports, which in 2009 amounted 6.2 thousand tons (42 % of total production). The development of modern fish processing bases in Poland also makes a solid potential for growth in the domestic production of rainbow trout. Additionally, farmers are relatively young and well educated e.g. acquired degrees in fisheries.

The production of the additional fish species is driven by the desire of breeders to increase the offer of new species sought after by consumers and the need to diversify production to reduce the problems with sales, especially of carp. To increase sales fish breeders increasingly process their products by themselves. Also certificates of specific character of carps and trout, more commonly referred to as "traditional specialities guaranteed", are produced to meet consumer demand for traditional products with specific characteristics. In 2009, 8 products of carp and one of trout had a “traditional specialities guaranteed" certificate according to Council Regulation (EC) No 509/2006 of 20 March 2006 on agricultural products and foodstuffs as traditional specialities guaranteed.

Extensive fish ponds are usually surrounded by reeds and strips of natural vegetation, which form an important habitat for flora and fauna.. Many farms were turned into multifunctional pond fish farms, which offer many other services in recreation, maintaining biodiversity and improving water management.

Freshwater fish production is dependent on the prevailing meteorological conditions. In the case of carp too low autumn temperature shorten the feeding period and growth of fish. However, in the case of trout too high temperature continuing in the period from June to August limit feeding and weight gains of fish. Excessive touch of fish are also due to the bad epizootic situation in

fish farms causing loss oversize. In 2010, there was a further decline in fish production in freshwater aquaculture because of adverse weather conditions, the growing problems of health-fish and water quality, and local flooding.

7.16.4. Data coverage and Data Quality

The economic performance includes all fish farms that breed and rear Atlantic salmon fry and cooperate with the Panel for Restocking appointed by the Minister of Agriculture and Rural Development (MARD) to stocking Polish marine areas and the maintenance and conservation of diadromous fishes in the surface inland waters.

Collecting economic data for freshwater species is not mandatory, in accordance with the provisions of Chapter IV, Part A, point of 2.2. Commission decision of 6 November 2008 (2008/949/WE).

A questionnaire was used to collecting all data. It was assumed that all rearing facilities and fish farms will return completed questionnaires. But in 2009 only 2 completed questionnaires returned. To estimate non-responses fish farms data information on the total stocking amount of salmon fry, obtained from the Panel on Restocking was used. Economic variables non-response fish farms were evaluated based on average figures obtained from the returned questionnaires.

Data on the size of the total aquaculture production in Poland is based on the questionnaire RRW-22 “Summary of surface fish ponds and the amount of fish produced in fish ponds and other devices for rearing”. It is obligatory for all aquaculture farms to complete the questionnaire according to the regulation of June 29, 1995 on public statistics (Journal of Laws of 1995, No. 88, pos. 439, with later amendments).

Differences between Eurostat data and data collected in the DCF arise from the fact that DCF collects data on production volumes sold, which differs from the volume of production generated during the year.

7.17. PORTUGAL

7.17.1. Overview of the sector

Portugal possesses natural conditions favourable to the development of aquaculture production. In 2009 there were 1,454 active companies in aquaculture, of which 92 % were bottom culture, 6 % were ponds and tanks and 2 % were floating structures.

The aquaculture companies are mostly small familiar units, under extensive exploration and producing mollusc's bivalves. Regarding the production of finfish, semi-intensive and intensive farms are dominant.

The Portuguese aquaculture sector employs directly about 2,306 persons, of which 2,024 are male and 282 female.

In 2009, the aquaculture production was 7,993 tons, representing an estimated total value of more than 44 million Euros. Total sales amount to 6,208 tons with a total income of 37 million Euros.

The production in marine and brackish waters remains the most important, accounting for about 88 % of total production. The production of finfish in brackish and marine waters represents 40% of the aquaculture production total (of which 97 % consists of "sea bass", "sea bream" and "turbot"). The shellfish accounted for approximately 48 % of the total production, with the clam species being the most widely produced, with the Algarve region having the largest weight (45 %) in national aquaculture production.

For their large production or great number of companies, the most relevant segments in Portugal are:

- Segment 3.2: Sea-bass and sea-bream on growing and fattening;
- Segment 6.2: Other marine fish (turbot) on growing and fattening;
- Segment 9.3: Clam bottom culture

Table 7.17.1: Economic Performance at national level: Portugal

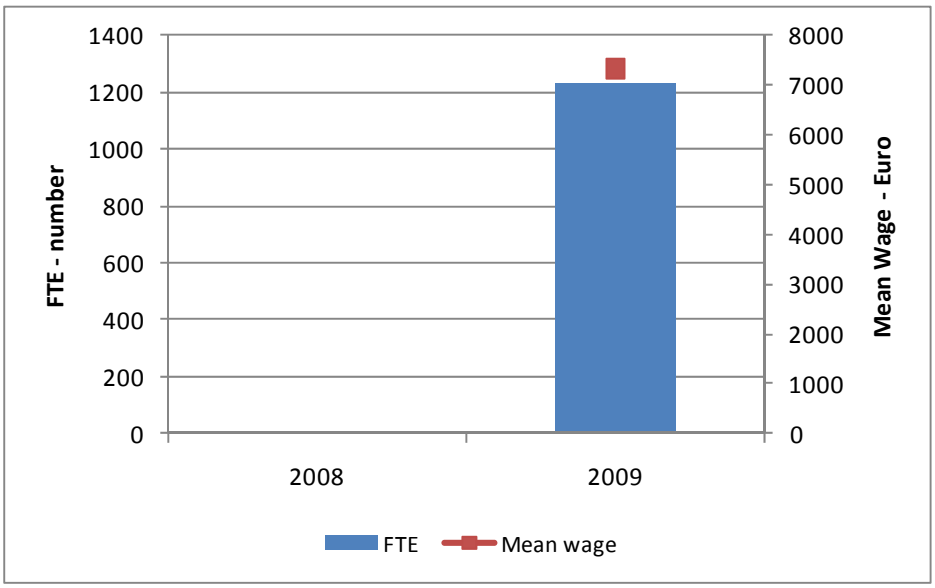
variable	unit	2008	2009	%Change
Number of enterprises	NUMBER	1463	1454	-0.6
Total sales volume	TONNE	6885	6208	-9.8
Turnover	000 EURO	40994	37250	-9.1
FTE	NUMBER		1227	
Gross Added Value	000 EURO	20251	16337	-19.3
EBIT	000 EURO		6913	
Return on investment	%		3.7	
Subsidies	000 EURO	0	0	
Labour productivity	000 €/FTE	8.6	13.3	54.2
Capital productivity	%		8.7	

In 2009 there was a change in Portuguese aquaculture with the closing of five finfish companies, responsible for the production of over 1,000 tons of Seabass.

A new company with high potential start producing in 2009, although with an initial production below her full capacity, but with a high level of investment that, by himself, is responsible for the decrease of ROI in 2009.

There are no economic data for 2008 for Portugal. Portugal had derogation for aquaculture both for Eurostat and DCF. The Portuguese National Program states that collection of economic data on aquaculture starts on 2011 for reference years 2009 and 2010.

Figure 7.17.1: Employment and average salary: Portugal



7.17.2. Structure and economic performance of the sector's main segments

The production in brackish and salt water shows an upward trend, verifying the concentration of the Portuguese aquaculture in 4 segments around the main species: sea bass, sea bream, turbot; mussels; oysters and clams.

The production of turbot has tripled in quantity and value compared to the previous year, as the result of the entry into operation of a new establishment with high yield potential. In contrast, there is a decline in sea bream production and sea bass, due to the closure of four important fattening units and one unit breeding in 2009.

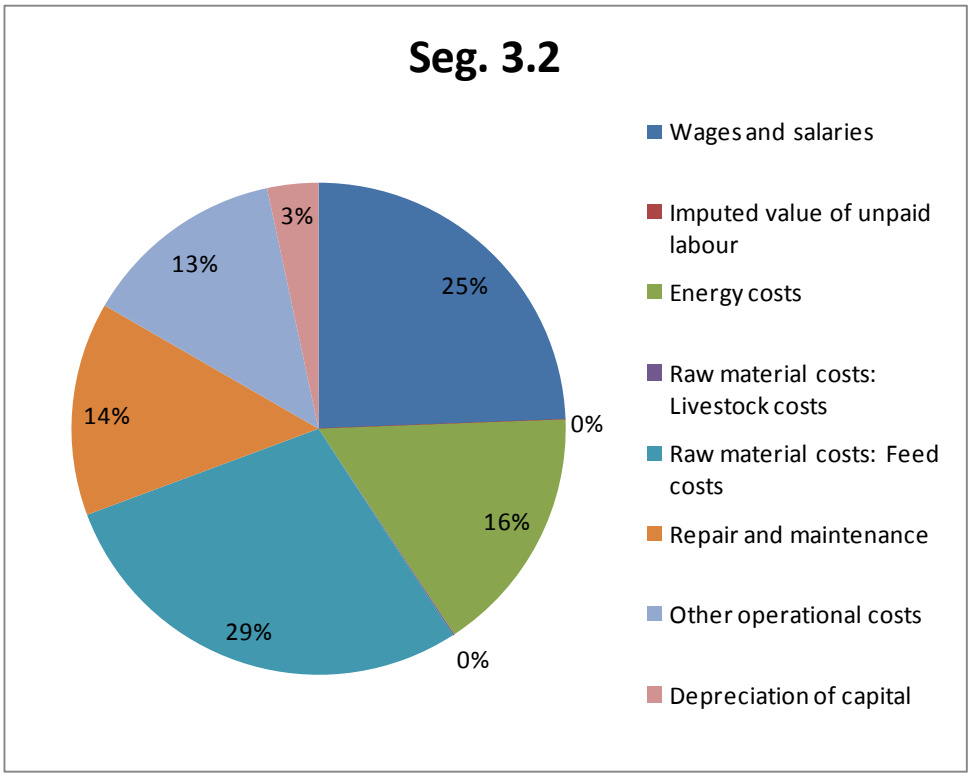
Table 7.17.2: Main segments and economic indicators: Portugal

Techniques		on growing	on growing	bottom
Species		Sea-bass and sea-bream	Other marine fish (turbot)	Clam
Environment		Saltwater	Saltwater	Saltwater
Number of enterprises	NUMBER	63	11	1274
Total sales volume	TONNE	1490	437	2175
Turnover	000 EURO	8280	3335	20367
Gross Added Value	000 EURO	834	-4568	
EBIT	000 EURO	-2027.90	-5716.10	
Return on investment	%	-20	-3	
FTE	NUMBER	202	65	823
Subsidies	000 EURO			
Labour productivity	000 €/FTE	4.13	-70.27	
Capital productivity	%	8.37	-2.56	
Running cost to turnover ratio	%	120.3	271.3	28.7
EBIT to turnover ratio	%	-24.49	-171.38	

Segment 3.2 (Sea-bass and sea-bream on growing and fattening): Composed by 63 enterprises, this segment has a turnover of about 8.3 million Euros. It is characterized by traditional production using earth ponds with high maintenance costs and low production densities. The welfare of fish and the environment are taken in high regard and the final product is of high quality. The high value of running cost to turnover

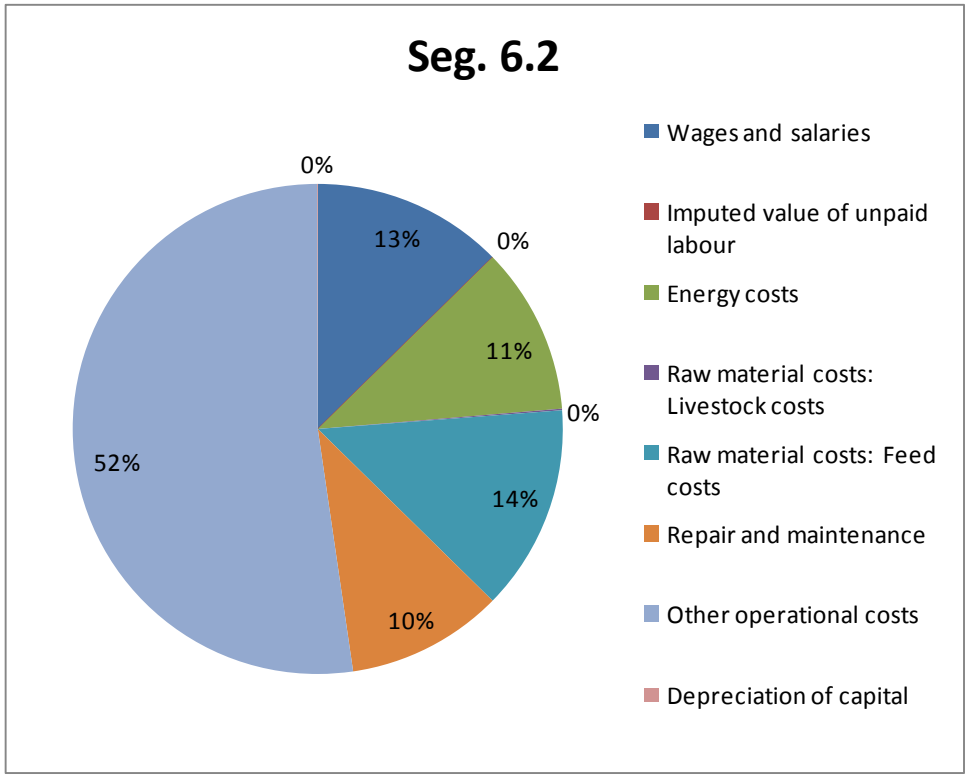
ratio of about 120 % might be a consequence of the difficulties this companies are facing regarding low prices of fish from foreign companies.

Figure 7.17.2: Operational costs structure for the Sea-bass and sea-bream on growing and fattening segment: Portugal



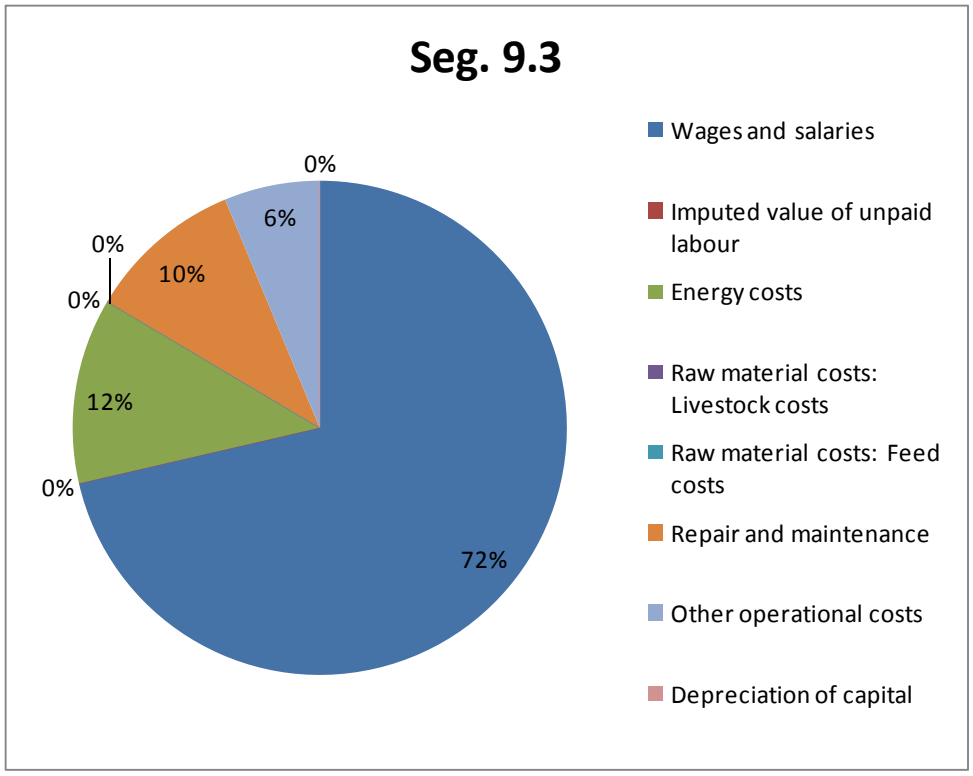
Segment 6.2 (Other marine fish (turbot) on growing and fattening): Production in this segment is intensive (mainly turbot). With only 11 companies in the segment, the appearance of a new big company in 2009 with high initial operating costs (other operational costs are more than half of total operational costs) and no sales creates a distorted view from the economic perspective. It is expected a growth of production in this segment for the next few years, mainly because of the new company.

Figure 7.17.3: Operational costs structure for the Other marine fish (turbot) on growing and fattening segment: Portugal



Segment 9.3 (Clam bottom culture): With 1,274 enterprises and a turnover of about 22 million Euros this is the most relevant segment in Portuguese aquaculture. Enterprises are mostly small familiar units run by the owner and its relatives. Bottom culture has a very low level of investments and operational costs are mostly wages and salaries (72 % of total operational costs). There are no feed costs.

Figure 7.17.4: Operational costs structure for the Clam bottom culture segment: Portugal



7.17.3. Trends and triggers

Portugal's aquaculture is largely confined to offshore sites and estuaries. Almost 90% of aquaculture facilities are located in publicly domain areas, based on 10-year private concessions, renewable for successive identical periods. The industry is characterised by a great deal of extensive farming, largely family-based. There has been a move to encourage aquaculture as an alternative for fishermen facing reduced fishing quotas.

Aquaculture in Portugal, largely mollusc-based, is less likely to have significant environmental impacts than, for example, large-scale aquaculture in parts of the Mediterranean and elsewhere. Some aquaculture facilities were constructed in public domain areas, without prejudice to the rules required by law and taking into consideration the need to conciliate the aquaculture production with environmental protection, through production methods environmentally friendly.

The aquaculture activities in Portugal are subject to a significant number of planning tools, planning and management that stand out to REN, the Sector Plan for Natura 2000, the POOC, the PDM Plans and Planning of Protected Areas (PPA).

Portugal will proceed to the development of a sector-specific plan for this activity in the short term. This sector plan in addition to planning the activity, concerns the identification of areas with fitness aquaculture in the coastal, estuarine-lagoon areas and offshore.

Aquaculture production is often accused of negatively influencing the environment although many of these negative effects are not scientifically proven. However, aquaculture activities, carried out under certain conditions, can make an important contribution to the recovery and environmental preservation and conservation of biodiversity.

The recovery of ponds of salt and their conversion to aquaculture is an example of a positive contribution to the restoration of environmentally degraded areas, including promoting the return of bird's characteristic of these areas (these units have specific areas for birds fitted with appropriate dimensions water).

Another example of this is the contribution of bivalves in the improvement of environmental quality, particularly water quality, as well as the operations of "ecological reforestation", so far only with a special expression in fresh waters, with fish produced in hatcheries and promoting the recovery of wild populations.

The possibility of using offshore technologies, especially in the production of bivalve molluscs, will relieve some pressure on the traditional areas of production.

On the other hand, production in the open sea is an alternative production method / supplement available to the sector that though not being the solution of all conflicts or difficulties that confronts the traditional production, is a way to consider as the product produced, given the characteristics and methodology of the production

system, may also be directed at different market niches, generating a greater appreciation.

This is combined with the fact that the aquaculture activities are subject to compliance with strict standards regarding water quality and the obligation of conducting Environmental Impact Assessment (EIA) for certain types and levels of production.

There are, however, several aspects that need to be a better balance in protecting the environment and should be taken into account in the future, a perspective of sustainable development activity. The mitigation of waste through actions at the level of improvement of feeding methods, sewage treatment and methods of cultivation are areas to consider.

When assessing the impacts on the environment of aquaculture activities is crucial to distinguish the different situations, not a confusing way of extensive production, sustainable and in symbiosis with the environment, with an intensive mode of production of very different characteristics.

The consumer is a good ally of an environmentally sustainable aquaculture. In fact, it is increasingly demanding with regard to hygiene, food safety and quality of products it consumes and is increasingly worried about the consequences for the environment. Producers will have to better meet this demand, in addition to the certification of products and consumer information.

Scientific research related to aquaculture remains a cornerstone of progress also on the environmental side, as well as the qualifications and training of professionals.

Modern aquaculture is an important "innovation" in the fish production and other aquatic foods. It accounts for about half the supplies of fish for human consumption worldwide with strong growth potential.

However, according to FAO estimates, the consumption of seafood will continue to increase and wild fish cannot fully cover the demand. Even if wild stocks reach levels

that ensure their maximum sustainable yield, aquaculture production will always be essential to meet the rapidly growing demand.

Aquaculture in Portugal needs to address a number of significant problems, notably competition from intensive aquaculture of other countries, whose products are imported. The need to differentiate Portugal's product acted as a main driver in his efforts to certify the production, with many facilities considering becoming more ecological. The goal of national fisheries policy in regard to aquaculture is to increase not only the production and product diversity, but also the product quality, in order to improve the sector's competitiveness. Structural modernization is also being promoted within the current fisheries management plan. These objectives are consistent with those established by the EU in the Common Fisheries Policy, and particularly the 2002 Strategy for the Sustainable Development of European Aquaculture, which promotes environmental, economic and social sustainability.

The Portuguese aquaculture was considered a priority area for development and some investment have been made in recent years. Over 125 million Euros, allocated between 2000 and 2006 under the MARE programme, focussed on investments in improving aquaculture operations. Under the 3rd Community Support Framework (CSF III), the emphasis has been on project analysis and environmental rules, including effluent treatment and the use of alternative energy sources and innovative technologies.

Under the Fisheries PO 2007-2013/PROMAR is expected to finance a very important set of actions for the sustainable development of this sector. In addition to supporting projects of installation or conversion / modernization of existing companies, there is also available support to the development of pilot projects and collective actions.

In order to bring more stability and competitiveness to the sector, additional financial resources are needed to support the adoption of some measures like the green oil or providing insurance for specific risks of this activity at suitable prices.

The prospect of growth of aquaculture production requires the availability of space for the deployment of new establishment or in the coastal sea and in space.

These spaces must have adequate conditions and bring some advantages to the activity. This is particularly important in the installation of facilities offshore, given the wide range of conditions that must meet, many of them with quite significant effort in terms of investment, production costs and plant safety.

The work in coastal waters, estuaries and lagoons of the maritime area is vital to the development of business and to simplify and expedite the process for its licensing.

The degree of simplification and speed of licensing in this activity depends strongly on the identification of areas with a vocation for aquaculture under the processes of spatial planning and the previous definition, by all entities involved in the licensing, the characterization of the activity to develop.

We must continue to invest in training and qualification of manpower for this activity and make it attractive not only for new investors but also for young managers.

Aquaculture thus appears as a key factor to consider in meeting the future demand for fish. The growth of aquaculture production in the near future is the only expected route to increase domestic production of fish.

7.17.4. Data coverage and Data Quality

Portuguese National programme for 2010-2013 predicts the starting of collection of economic data for aquaculture in 2011, referring to the years 2009 and 2010. An additional effort was made to also collect data for 2008. The data for 2008 was provided but some variables (economic) are not precise enough in order to make reliable comparisons with forward years. This is in line with the derogation Portugal got from Eurostat to produce statistic under the new regulation.

The great number of segments and the great concentration of production units in some of them bring some confidentiality issues and some aggregations were needed.

The production and sales value and volume data used in the data collection program was the same used to compile the statistics to Eurostat.

7.18. ROMANIA

7.18.1. Overview of the sector

Romania mentions that 2009 is the first year on implementation for data collection programme for aquaculture sector. The overview of the sector points out that the number of farms comprises 315 companies licensed for aquaculture production in 2009 with a total turnover of almost 14 million Euros (see Table 7.18.1). The companies are located in all regions of the country, out of which 30 in the mountains for trout and the other ones in plains and heal comprising the rest of fresh water species.

The actual situation of the sector is dependent of the few significant factors:

- the lack of available capital for investments, the financial sector is not “friendly” with fisheries activities - generally speaking - due to the fact that the land on which the farms are located belongs to the state and is rented on long term basis by the operators;
- the lack of governmental subsidies or any other kind of support;
- a significant part of the investors (owners) of this companies are not specialized in aquaculture, they are investing money seeking the profit (e.g. the main activity is represented by recreational fishery on several farms);
- a high competition due to the low prices of the similar fish species imported from: Poland, Hungary, Slovakia, Bulgaria and the price policy of the supermarket chains - the main buyers of the domestic production, or by marine fish species imported from: Greece, Norway etc.

The main segments are represented by:

- Carp combined (Segment 4.3) and Carp on growing (Segment 4.2). The main species cultured are common carp and other fresh water species and Asiatic cyprinids. The technique is land base aquaculture in an extensive way and combining the species on growing.

- Trout on growing (Segment 2.2) and Trout combined (Segment 2.3). The main species is trout cultured in raceways farms, 80% belonging to the state in specialized company for forestry, especially in the mountains area where the farms are located.

Table 7.18.1: Economic Performance at national level: Romania

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	0	315	
Total sales volume	TONNE		7292	
Turnover	000 EURO		13896	
FTE	NUMBER		2542	
Gross Added Value	000 EURO		25067	
EBIT	000 EURO		13763	
Return on investment	%		7.8	
Subsidies	000 EURO		0	
Labour productivity	000 €/FTE		9.9	
Capital productivity	%		14.3	

In Romania aquaculture sector has not a significant share, comparing with other economic sectors, but represents near 70 % of the total fishing activities (aquaculture plus inland and marine fishery).

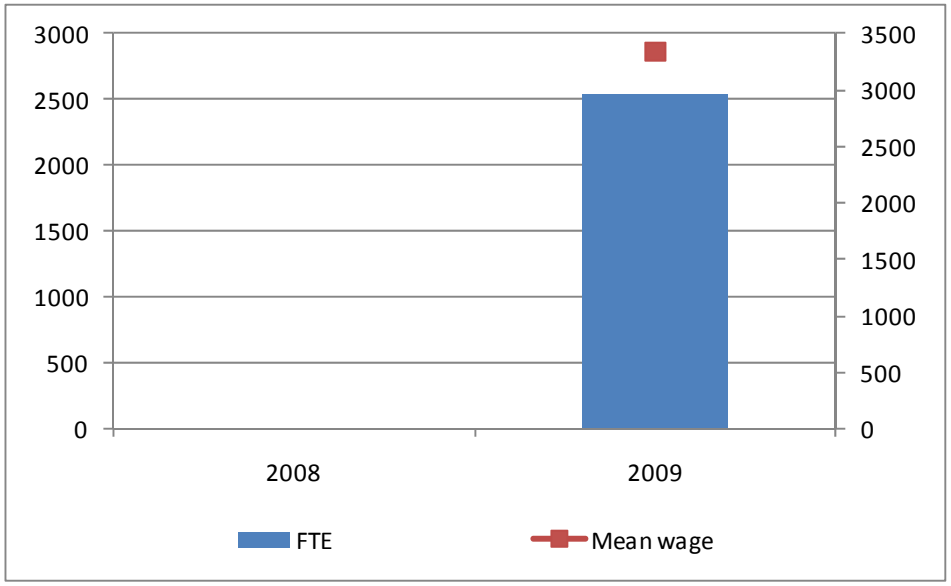
The extensive technique used by the most of producers (in lakes for accumulation of water where this activity is allowed, ponds, enclosures and pens) characterise the land based aquaculture. Despite the lack of subsidies or other financial support, the economic performance are at a satisfactory level, corresponding to the actual technical conditions of the farms, the economic indicators having an acceptable level.

It should be mentioned that in Table 7.18.1, the GVA is higher than the turnover because of the high income coming from other activities in the sector (i.e. recreational fishing), which are included in the GVA calculation.

The value of the turnover is influenced by the sales products and the level of fish consumption, which is not more than 4.7 kg/capita, due to the fact that the prices are little big higher for domestic market, where the production is sold in a percentage of 90%.

Around 80 % of the owners are private investors. The number of persons employed is 2452, as FTE see Figure 7.18.1, out of which 1930 male and 549 female.

Figure 7.18.1: Employment and average annual salary: Romania



7.18.2. Structure and economic performance of the sector's main segments

The main segments are represented by:

- Carp combined (Segment 4.3) and Carp on growing (Segment 4.2). The main species cultured are common carp, including Asiatic cyprinids, including other fish from these family species, and other fresh water species as pike, catfish, pike (*Essox lucis*), perch (*zander*). The technique is land base aquaculture in an extensive way and combining the species on growing.
- Trout on growing (Segment 2.2) and Trout combined (Segment 2.3). The main species is trout cultured in raceways farms, 80% belonging to the state in a specialized company for forestry, especially in the mountains area where the farms are located.

Table 7.18.2: Main segments and economic indicators: Romania

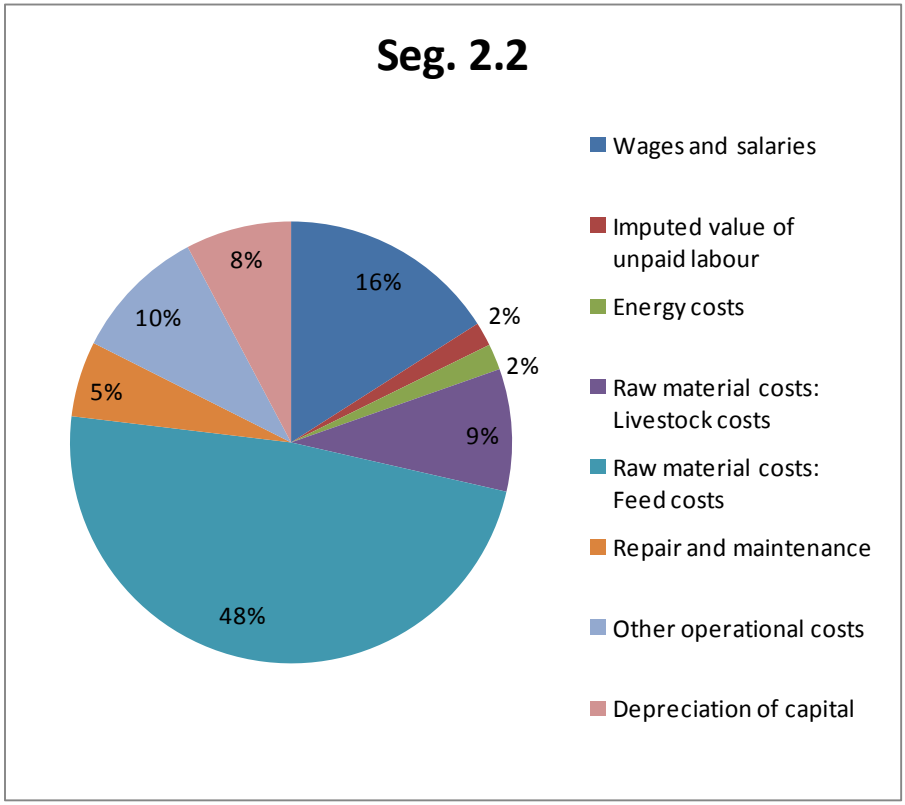
Techniques		On growing	Combined	On growing	Combined
Species		Trout species	Trout species	Carp, including Asiatic cyprinids and other fresh water species	Carp, including Asiatic cyprinids and other fresh water species
Environment		Fresh water	Fresh water	Fresh water	Fresh water
Number of enterprises	NUMBER	12	18	186	94
Total sales volume	TONNE	262	176	2521	4322
Turnover	000 EURO	827	765	4249	7991
Gross Added Value	000 EURO	648	818	21687	1263
EBIT	000 EURO	373	445	17513	-5156
Return on investment	%	16.2	14.9	17.1	-7.9
FTE	NUMBER	34	66	1116	1287
Subsidies	000 EURO				
Labour productivity	000 €/FTE	19.1	12.4	19.4	1.0
Capital productivity	%	28.2	27.5	21.1	1.9
Running cost to turnover ratio	%	120.8	116.7	368.7	229.0
EBIT to turnover ratio	%	45.1	58.2	412.2	-64.5

The Segment 2.2 - Trout on growing of 12 companies with a total turnover of 827 thousand Euros. GVA is calculated including other income (basically rising from recreational fishery, as an alternative to the productive one), showing an acceptable level of profitability.

Considering the operational costs on Segment 2.2, Figure 7.18.2, it could be observed that the main category is represented by raw material costs for feed and live stock - 57% of total costs, corresponding to the target of companies and to the technology applied - raceways. The relative

lower level of depreciation illustrates the fact that the farms are very old, owned by the state (cca. 80%) and the lack of new investments.

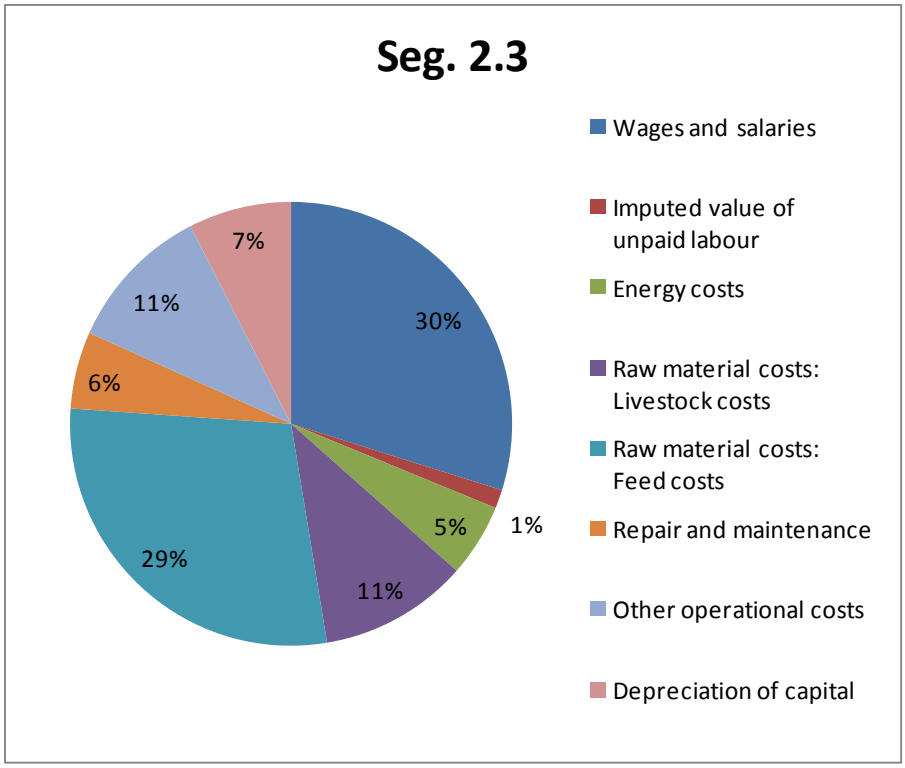
Figure 7.18.2: Operational costs structure for trout species on growing: Romania



The Segment 2.3 - Trout combined looks similar to the previous one, totalling a number of 18 companies. The profitability indicators show a good situation due to the higher prices of sold produce of nurseries and hatcheries, considering the higher level of GVA, what includes other income.

Considering the operational costs on Segment 2.3, Figure 7.18.3, the main costs in total costs are represented by feed and live stock costs - 40%, and wages and salaries - 30% (for nurseries and hatcheries activity a better qualified employment is necessary).

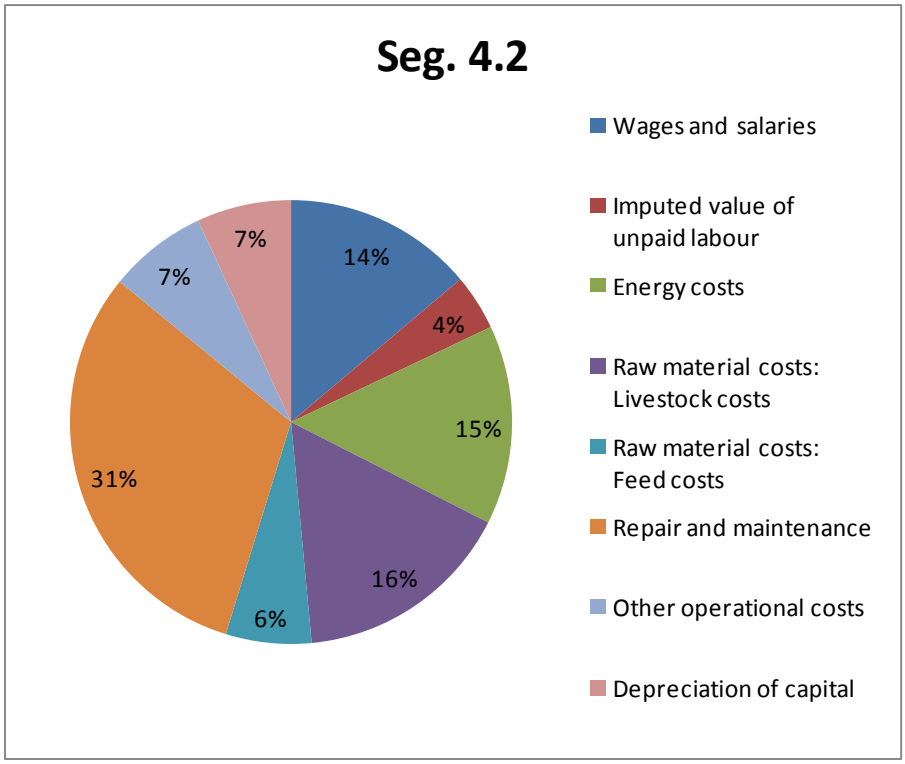
Figure 7.18.3: Operational costs structure for trout species combined: Romania



The Segment 4.2 (Carp on growing) includes main species such as: carp, crucian carp, other cyprinids, including a significant component of Asiatic cyprinids (silver carp, bighead carp, grass carp) and other fresh water species (cat fish, pike-perch and northern pike, etc.). The total turnover is 4,248.5 thousand Euros for 186 companies. The GVA (calculated based on inclusion of other income) has an appreciable level. A significant part of these companies applies for alternative/additional activity such as recreational fishery and touristic one (especially over the week-ends), having, consequently a good level of ROI and EBIT (Earnings Before Interest and Tax), the biggest in the sector.

The analyze of the structure costs for Segment 4.2, Figure 7.18.4, shows the highest share for repair and maintenance - 31% (due to the age of significant part of constructions, which are very old) and for live stock - 16% corresponding to an extensive technology used.

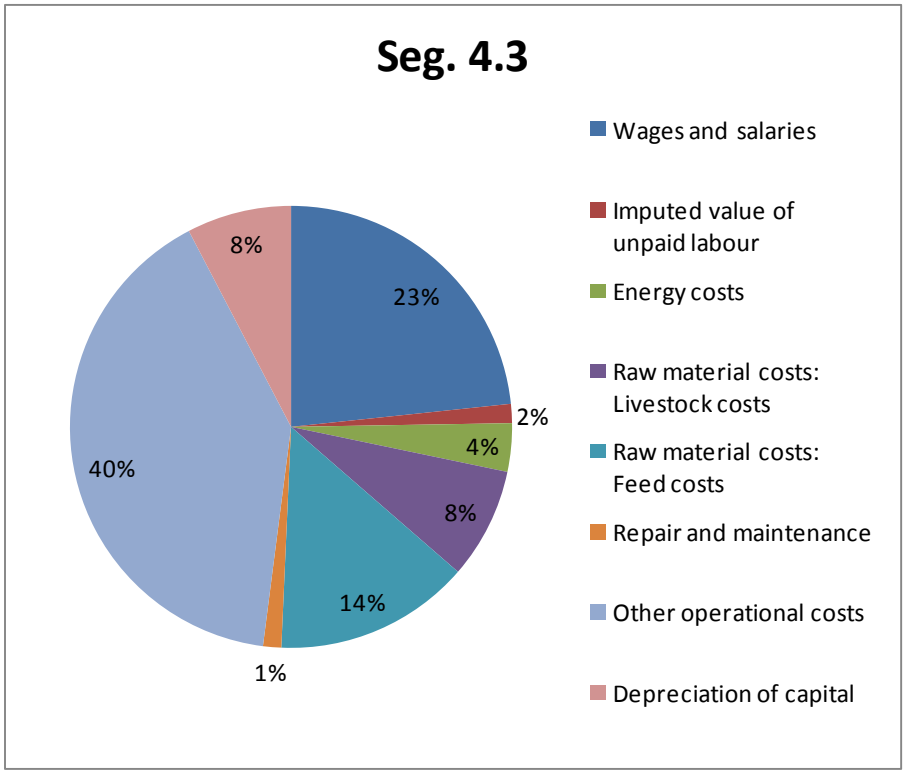
Figure 7.18.4: Operational costs structure for carp on growing: Romania



The Segment 4.3 (Carp combined) includes the same species as the previous one. The total turnover is almost 8 million Euros for 94 companies. Despite the fact the turnover is the biggest in the sector, as value, the GVA is lower than for the Segment 4.2 and ROI and EBIT indicator have a negative value. It could be owed to the fact that the companies have stocks of produce, preferring to sell it later on the market, especially the juveniles and fingerlings targeting higher prices and best period to sell it (the activity is seasonal).

The Segment 4.3, Figure 7.18.5, is characterised by other share of costs in total sum, represented by wages and salaries - 23% (for nurseries and hatcheries activity a better qualified employment is needed) and other operational costs - 40%, such as: fees for the rent on a long term basis - concession, water cost is an important one, security cost of the location - considering the position of the farms - faraway from localities, the most part in isolated areas.

Figure 7.18.5: Operational costs structure for carp combined: Romania



7.18.3. Trends and triggers

The aquaculture is practised on licenses base issued by the national authority for fishery and aquaculture, being organised the Aquaculture Units Register (RUA) at national level. The major influence no subsidies or other governmental support for the sector).

Starting with 2010 some farms started to introduce new species - sturgeons under EFF projects.

For 2010 and 2011 it is expected a easy growth in volume, but a possible decline in value as a result of slight decrease level of prices; these limits are consequences of the economic crisis.

7.18.4. Data coverage and Data Quality

In Romania, 2009 was the first year for data collection in aquaculture and the range of coverage should be improved.

Data availability is at a satisfactory level considering the range of coverage, but still there are problems on the collection of data, what should be avoided in the next years.

It was quite difficult to collect data due to ”Confidentiality right” appealed by the companies involved in the sector.

There are no negative aspects considering the segmentation on enterprise level, the homogeneity of the segments in terms of techniques and species.

It is not easy to reveal relevant differences with other official data sources since the collecting process were implemented for the first time. Although, Romania is invited to take the necessary measures (in legal or administrative frame) to improve the quality and to avoid differences with data collected from other official sources (i.e. Eurostat).

7.19. SLOVENIA

7.19.1. Overview of the sector

Aquaculture in Slovenia comprises freshwater aquaculture (cold-water fish farming of salmonids, warm-water fish farming of cyprinids) and mariculture (fish and shellfish farming). Warm-water and cold-water fish farming has been practiced since the end of nineteenth century, while mariculture has a shorter history: it started at the end of the twentieth century. The major species contributing most of the production value in freshwater fish farming are rainbow trout (*Oncorhynchus mykiss*) and common carp (*Cyprinus carpio*), whilst in mariculture it is Mediterranean mussel (*Mytilus galloprovincialis*) and European seabass (*Dicentrarchus labrax*).

Mariculture practice is traditional. Fish farming takes place in cages submerged into the sea, while mussel farming takes place in a standard manner in lines of floating buoys linked together, with longline nets hung from them. In 2007, three larger areas were designated for marine aquaculture in Slovenian territorial waters that were subsequently separated into 22 plots, for which concessions were granted for the use of marine water in 2009. It is expected that these plots will not be able to expand, due to the use of Slovenian territorial waters for other purposes. Currently, all the concessions for using marine water for the breeding of marine organisms have been granted, 2 of them for breeding marine fish and 20 for breeding shellfish. The total area for breeding fish at sea (excluding shellfish farming) in 2009 was 5 663 m^2 (2 plots). The area of the 20 plots at sea that are used for shellfish farming was 45.1 ha.

Due to natural circumstances, the development of marine fish farming in Slovenia is limited. Mariculture takes place in the Bay of Strunjan, the Bay of Debeli rtič (shell-fish farming) and in the Bay of Piran (fish and shell-fish farming).

Mariculture shellfish farming is more important than fish farming. The major and the only cultured shellfish species, Mediterranean mussel , accounts for 83 % of total mariculture

production. The production of European seabass is more important than the production of gilthead seabream. It contributes 17 % to total mariculture production.

Since the early eighties (1982) the production of the Mediterranean mussel (*Mytilus galloprovincialis*) has been increasing and in 1988 it reached a maximum of 703 tonnes. After that year a significant decline was due to the fact that exports to Italy ceased. In 1995 the production of mussels reached a minimum of 12 tonnes. In recent years, there are increases in production, particularly due to the resolution of the status of shellfish production facilities through the granting of concessions for the use of marine water: first in 2001 and then in 2003, when production reached 135 tonnes, the highest since 1992. There was also a peak in production in 2009, with 311 tonnes of Mediterranean mussels produced. Current production covers mainly the needs of the domestic market. In recent years, considerable difficulties occurred in the production of shellfish due to the frequent closures of sales because of the occurrence of biotoxins, which prevents shellfish farms to be used to their full production capacity.

From 1991 onwards intensification was carried out especially with farming European seabass and seabream in the Bay of Piran. A first result of seabass production in 1992 was 5.7 tonnes. In subsequent years annual variations in production (growth and decline) were noted. In 2001 production reached its maximum with 59 tonnes, and very similar amounts were noted in 2003. Here, there was a peak in production in 2009 as well, with 65 tonnes of seabass.

The first results of seabream production in 1992 were 4 tonnes. In the following years there was a growth in production, with some variations, until 1997 when production reached a maximum of 61 tonnes. After that year production declined and reached a minimum of 6 tonnes in 2001. In 2003 production was 16 tonnes. In 2009, there was no production of seabream.

Slovenia is a net importer of fish and fish products. In 2009 imports were approximately four times larger than exports. There is a continuous import of fresh farmed species: seabream, seabass and salmon. The majority of the imported fish products come mainly from the European Union and are frozen, dried or processed.

It should be considered that data presented in this report, were collected only for the marine fish species.

Table 7.19.1: Economic Performance at national level: Slovenia

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	11	11	0.0
Total sales volume	TONNE	295	380	28.9
Turnover	000 EURO	519	711	36.9
FTE	NUMBER	26	32	21.6
Gross Added Value	000 EURO	2262	2118	-6.4
EBIT	000 EURO	1584	1379	-12.9
Return on investment	%	49.9	45.1	-9.5
Subsidies	000 EURO			
Labour productivity	000 €/FTE	85.9	66.1	-23.0
Capital productivity	%	71.2	69.3	-2.7

In 2009, there were 9 companies in Slovenia dealing with shellfish farming, primarily with mussel farming (Mediterranean mussel). The shellfish are farmed using hanging ropes that are attached to rafts.

In the same year were only two companies that were engaged in breeding of fish. Main species for breeding are sea bream and sea bass. Main farming techniques is breeding in cages.

In 2009 Slovenia had 10 companies with 5 or less employees and 1 company with more than 10 employees. The status in employment reflects the situation in the aquaculture sector whereby the majority of small family farms operates with self employed persons, mostly one employee and some unpaid assistance from family workers.

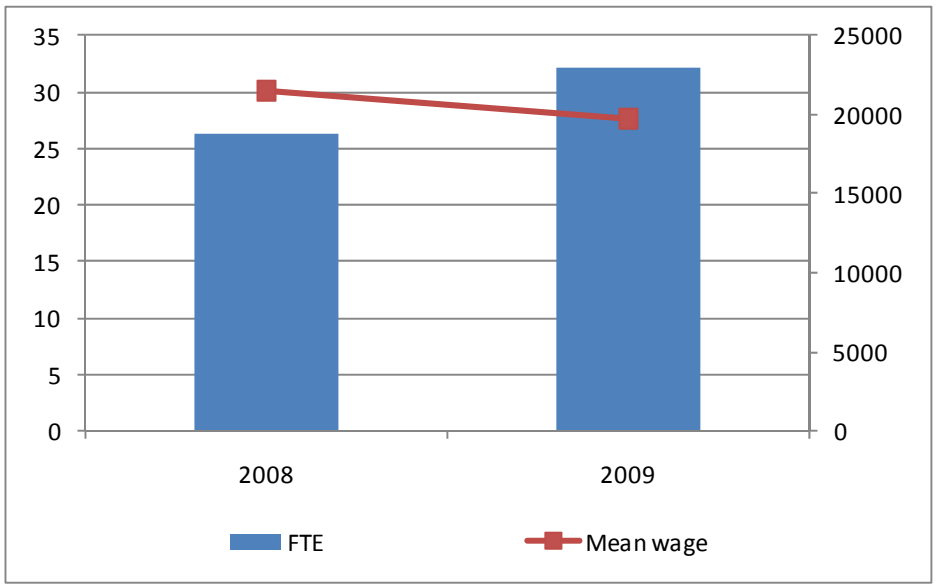
In 2008, the turnover was 519 thousand Euros; in 2009, the turnover increased by 36.9 % and amounted almost 711 thousand Euros.

The total sales volume increased by 28.9 % from 2008 to 2009, being 295 tons in 2008 and 380 tons in 2009.

In the Slovenian aquaculture sector there were 26.35 FTE employees in 2008 and 32.05 FTE employees in 2009. Employment was therefore increased by 21.6 %. With respect to the gender of those employed, men are predominated in the aquaculture sector. In 2009, only 2 women (6 %) were involved.

The main segments in the Slovenian aquaculture sector are Sea bass & Sea bream cages (seg3.4) and Mussel rafts (seg7.1).

Figure 7.19.1: Employment and average annual salary: Slovenia



Average salary per FTE employees in 2008 was €21,513 in 2009 average salary per FTE employees decreased by 8.3 % and amounted €19,727.

7.19.2. Structure and economic performance of the sector's main segments

They are two main segments in the Slovenian aquaculture sector; Sea bass & Sea bream cages (seg3.4) and Mussel rafts (seg7.1). The most important species are Mediterranean mussel and European seabass.

In terms of sales volume mariculture shellfish farming is more important than fish farming. The major and the only cultured shellfish species, Mediterranean mussel, accounts for 83 percent of total sales volume. The sales volume of European seabass is more important than the sales volume of seabream. It contributes 17 percent to total mariculture production.

Since the early eighties (1982) the production of the Mediterranean mussel (*Mytilus galloprovincialis*) has been increasing and in 1988 it reached a maximum of 703 tonnes. After that year a significant decline was due to the fact that exports to Italy ceased. In 1995 the production of mussels reached a minimum of 12 tonnes. In recent years, there are increases in production, particularly due to the resolution of the status of shellfish production facilities through the granting of concessions for the use of marine water: first in 2001 and then in 2003, when production reached 135 tonnes, the highest since 1992. There was also a peak in production in 2009, with 311 tonnes of Mediterranean mussels produced. Current production covers mainly the needs of the domestic market. In recent years, considerable difficulties occurred in the production of shellfish due to the frequent closures of sales because of the occurrence of biotoxins, which prevents shellfish farms to be used to their full production capacity.

From 1991 onwards intensification was carried out especially with farming European seabass and seabream in the Bay of Piran. A first result of seabass production in 1992 was 5.7 tonnes. In subsequent years annual variations in production (growth and decline) were noted. In 2001 production reached its maximum with 59 tonnes, and very similar amounts were noted in 2003. Here, there was a peak in production in 2009 as well, with 65 tonnes of seabass.

The first results of seabream production in 1992 were 4 tonnes. In the following years there was a growth in production, with some variations, until 1997 when production reached a maximum of

61 tonnes. After that year production declined and reached a minimum of 6 tonnes in 2001. In 2003 production was 16 tonnes. In 2009, there was no production of seabream.

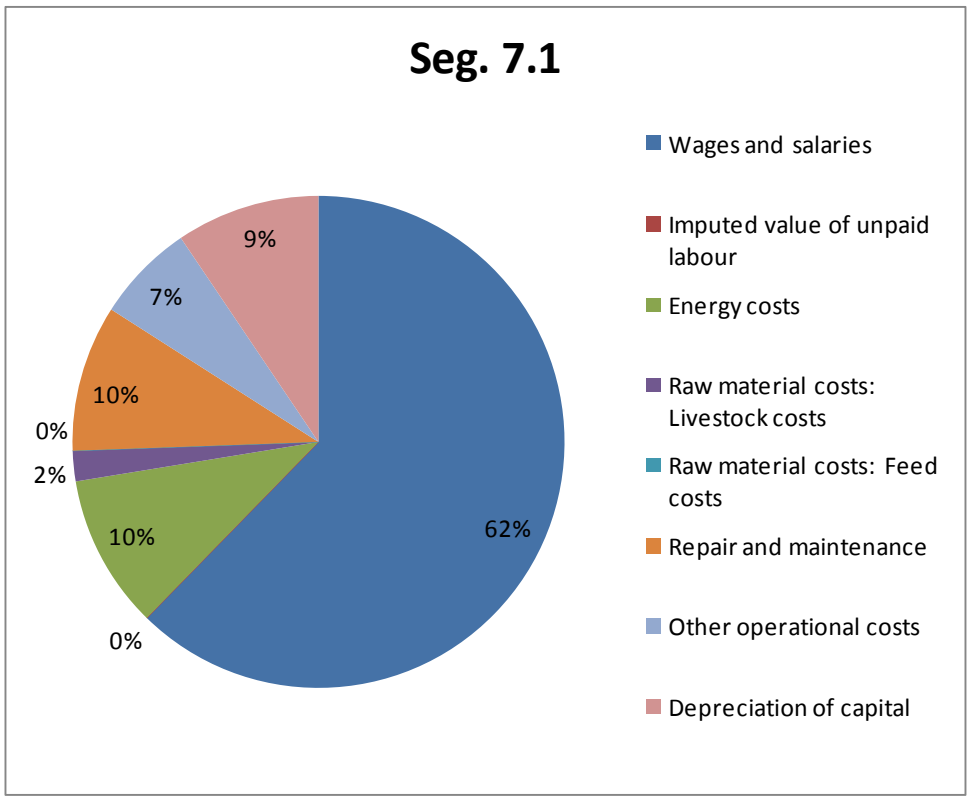
Table 7.19.2: Main segments and economic indicators: Mussel rafts: Slovenia

Techniques		Rafts
Species		Mediterranean mussel
Environment*		saltwater
Number of enterprises	NUMBER	9
Total sales volume	TONNE	315
Turnover	000 EURO	219
Gross Added Value	000 EURO	1256
EBIT	000 EURO	941
Return on investment	%	107.1
FTE	NUMBER	16
Subsidies	000 EURO	
Labour productivity	000 €/FTE	78.3
Capital productivity	%	143.0
Running cost to turnover ratio	%	181.3
EBIT to turnover ratio	%	428.8

In terms of sales volume, sales volume of the Mussel rafts segment represent 83 % of the total sales volume of Slovenian aquaculture sector in 2009. Turnover from this sector represent 31 % of the total turnover in the same year. In the Mussel rafts sector were 16.05 FTE employees in 2009, which represent 50 % of all FTE employees in Slovenian aquaculture sector in the same year.

In terms of other economic indicators, the amount of EBIT, GVA and Labour productivity generated by the Slovenian Mussel rafts sector in 2009 were 941 thousand Euros, 1,256 thousand Euros and 78 thousand Euros respectively, see Table 7.19.2.

Figure 7.19.2: Operational costs structure of mussels raft: Slovenia



The largest cost item of Mussel rafts sector in 2009 were the Wages and salaries, accounted for 62 % of the total operational costs. Energy costs and Repair and maintenance costs made up each 10 % of all operational costs. Depreciation of capital and Other operational costs were 9 % and 7 % respectively.

7.19.3. Trends and triggers

The Ministry of Agriculture, Forestry and Food is responsible for fisheries and aquaculture in Slovenia. Fisheries comprises capture fisheries, aquaculture of fish and other water animals and trade in fisheries products. Inland fisheries, fish farming and fish health are managed by three main Acts: the Freshwater Fishery Act, the Livestock-breeding Act (ZŽiv) and the Veterinary Service Act (Zvet) and their regulations, ordinance, etc. Marine fisheries, fish and mussel farming are regulated by Marine Fisheries Act (ZMR-2). In fisheries and aquaculture it is

necessary to take into consideration the Environment Protection Act (ZVO), the Nature Conservation Act (ZON), and the Water Act (ZV).

The main leading government agency in fisheries and aquaculture is the Directorate of Forestry, Hunting and Fisheries within the Ministry of Agriculture Forestry and Food. The main task of the Directorate is to provide overall administrative control of aquaculture and fisheries, to ensure an adequate legislative framework for aquaculture and fisheries, and to carry out related legislative tasks. The Directorate is directly involved in controlling the operation of fish farms, licensing procedure of alien species or hybrids and is also responsible for the maintenance of fish stocks in natural waters. The concessions for the use of water, which are the prerequisite for setting up a fish farm in Slovenia, are, however, granted by the Ministry of Environment and Spatial Planning. The Directorate manages that part of the state budget which is designed for fisheries and aquaculture. The funds are used for a variety of purposes, including the financing of the setting up and the management of fisheries information systems; financing of performing public service in fisheries by the Fisheries research institute of Slovenia; for the protection of natural resources Development in the Republic of Slovenia 2007-2013; as well as for the collection of data in and monitoring in fisheries. Ecological, biological research and the breeding of some indigenous species (Danube salmon, grayling, nase) are conducted in the Fisheries Research Institute of Slovenia. The Marine Biology Station of the National Institute for Biology deals with interdisciplinary research of the sea.

There has been a dynamic change in the fish production sector due to economic changes in the period from the independence of Slovenia to its accession to the European Union and after the accession. In the future it would be reasonable to support research projects such as: analysis of potential possibilities in fish farming development in Slovenia with regards to spatial and hydrological circumstances and research into the possibility of economic farming of new species. It would also be reasonable to continue with investment in the modernization of older fish farms, especially the improvement of hygienic conditions and the construction of new fish farms which comply with EU legislation technologically and ecologically. It would also be necessary to adopt all outstanding fisheries legislation and encourage the establishment of aquaculture producer organisations with a view to the development of fish farming in terms of small and medium sized

family fish husbandry. These measures would facilitate the more competitive position of Slovenian fish farming. Natural circumstances and conservation requirements in Slovenia do not allow the development of large industrial farms. The establishment of producer organisations would make it easier to obtain knowledge, new technology and reduce market costs.

Future development of Slovenian mariculture is strongly conditioned by the small size of the Slovenian Sea. In 2007, three larger areas were designated for marine aquaculture in Slovenian territorial waters that were subsequently separated into 22 plots, for which concessions were granted for the use of marine water in 2009. It is expected that these plots will not be able to expand, due to the use of Slovenian territorial waters for other purposes. All Slovenian maritime fish and shellfish farms currently operating with about 50% capacity. In the future we can expect increasing production to maximum capacity and then stagnation of Slovenian marine aquaculture.

7.19.4. Data coverage and Data Quality

Data were collected only for the marine fish species.

Regards to the data base ‘’The central register of aquaculture and commercial ponds’’ from MAFF, in 2009, there were 9 operators in Slovenia dealing with shellfish farming and two subjects that were engaged in breeding of fish. The data for the operators mentioned were collected from multiple sources (AJPES, questionnaire, MAFF), allowing for cross checking. The accounting data, which are collected by the AJPES public agency, are already checked and verified. The data were collected for all 11 subjects.

In July 2010 the questionnaires for 2009 were sent to all operators and ten of them also returned the questionnaire. Therefore, the response was 91 %.

Economic data on the aquaculture sector were collected from accounting records – AJPES and through questionnaires. The national program for collection of economic data for the aquaculture sector combines information from three main resources:

1. Questionnaire information returned from the aquaculture sector on a voluntary basis,
2. Data base: 'The central register of aquaculture and commercial ponds' from MAFF,
3. The annual accounts of business enterprises.

The data collected from all sources are combined in such a way that a complete set of accounting items is compared for each business enterprise.

In cases where a questionnaire, as the only source, was used the response rate was 91 %. In cases where the data from annual accounts of business enterprises was used the response rate was 100 %, because we have economic reports for all investigated companies.

The economic variables were collected on the basis of Council Regulation (EC) No 199/2008 and the Appendix X to the Commission Decision (EC) 949/2008. Slovenia has uploaded the complete set of requested data to the JRC server before the deadline.

While due to confidentiality issues because of the low number of marine fish farms, we are only presenting Mussel rafts segment (segment 7.1) in the chapter 7.19.2: ''Structure and economic performance of the sector's main segments''.

Typical Slovenian maritime enterprise is small family fish/shell farm with self employed persons, mostly one employee and some unpaid assistance from family workers. Regarding techniques and species all Slovenian marine segments are very homogeneous. Marine fish farming practice is normally intensive and takes place in floating platforms where the cages are submerged into the sea. They produced mostly European seabass. Shellfish farming practice is extensive and takes place in lines of floating buoys linked together, where longlines with mussels are suspended. The major and the only cultured shellfish species is Mediterranean mussel.

In case of Slovenian data, there are differences between Eurostat and DCF data. The difference is because the Eurostat data also contain data from freshwater aquaculture.

List of acronyms and abbreviations

AJPES - The Agency of the Republic of Slovenia for Public Legal Records and Related Services.

MAFF - The Ministry of Agriculture, Forestry and Food of the Republic of Slovenia.

VARS - Veterinary Administration of the Republic of Slovenia.

7.20. SPAIN

7.20.1. Overview of the sector

Spain has an important aquaculture, whose principal feature is its high diversity, with productions in freshwater fishes, marine fishes, molluscs, crustaceans, and algae. All these aquaculture forms spread for all the country.

Spain reached a production of 268,600 tonnes for human consumption in 2009, a bit higher than previous year, although it has not reached the 2005 production, the highest one in the decade.

Spain has also an important production, which is not included in the previous figure, in juveniles and eggs (fishes and molluscs) which are produced mostly to be grown in other establishments but also to restock rivers or coastal zones. These quantities produce a turnover which has been increasing in the last years, and can get the 10 % of the total amount.

This high production can be get thanks to the 5,388 aquaculture establishments which exist in Spain and which are joined in 3,105 enterprises. The FTE in 2009 was 6,231, a 79 % developed by men and the 21 % by women.

The principal species produced in Spain are mussel, cultivated in more than 3,500 rafts mostly concentrated in Galicia, seabream grown in Mediterranean Sea in cages, seabass, which is often cultivated by the same companies than the previous specie, and rainbow trout representing freshwater aquaculture, although there are other freshwater species, like tench. We must not forget turbot, which is quickly increasing its production (in 2009 was more than the double than in 2002).

It is important to mention other species, which have secondary productions but they are also important in their areas: prawns and shrimps, senegalensis sole, blackspot seabream, caviar from sturgeons and algae for human consumption cultivated in long lines, among other examples.

All these different productions (tonnes for human consumption, eggs and juveniles as raw material for other establishments or to restock the environment), gave the amount of the turnover of more than 440 million Euros. If the subsidies and other income are added to the turnover, the total income was more than 467 million Euros.

The number of companies keeps regular, comparing 2008 and 2009, although there are fewer enterprises with less than 5 employees and more enterprises with 6-10 employees.

In the Spanish aquaculture, the GVA has decreased in 2009 a 29 %, mostly due to the drop in the turnover (nearly 5 %) comparing with 2008. The total sales (tonnes and quantity of juveniles) have decreased in general.

The EBIT has a significant negative value, for both 2008 and 2009, of about 65 million Euros losses. This is in part due to the poor economic performance that some segments have shown during these years, such as the Sea bass and sea bream cages that had 35 million losses (negative EBIT) in 2009. But it should be noted that other segments like the trout on growing and mussels in rafts have obtained profits (positive EBIT) in 2009.

The labour productivity decreases because of GVA drop, because the FTE keeps almost regular (just a drop of 5 %). It would be interesting to have information on how the FTE data are divided between self-employed workers and other workers.

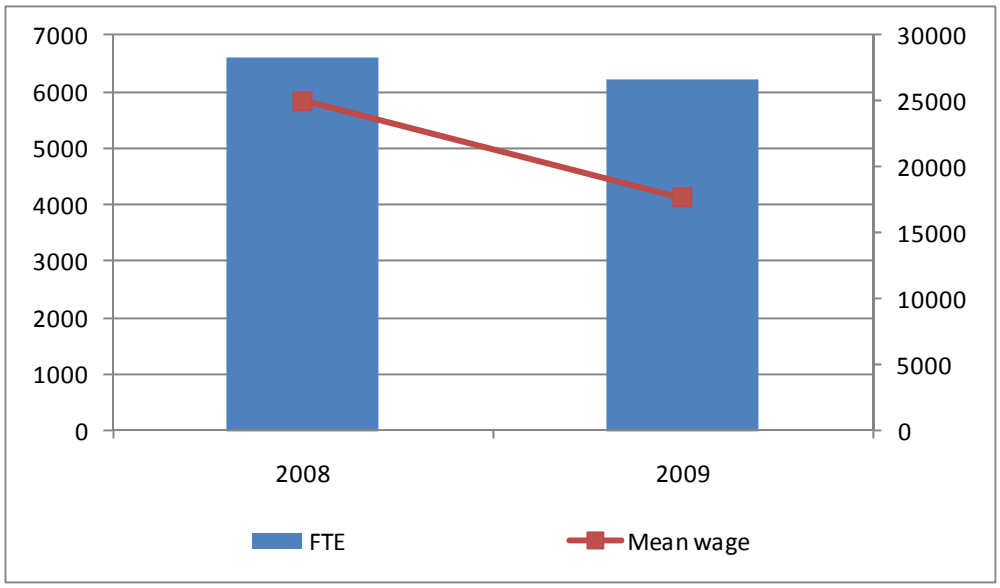
Nearly all the defined segments are represented in Spain. However, the main segments in the Spanish aquaculture according with the segments previously established are:

- Segment 2.2: Trout on growing:
- Segment 3.4: Sea bass and sea bream cages:
- Segment 6.2: Other marine fish on growing
- Segment 7.1: Mussel rafts

Table 7.20.1: Economic Performance at national level: Spain

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	3101	3105	0.1
Total sales volume	TONNE			
Turnover	000 EURO	462605	440028	-4.9
FTE	NUMBER	6612	6231	-5.8
Gross Added Value	000 EURO	100809	71006	-29.6
EBIT	000 EURO	-65733	-65315	0.6
Return on investment	%	-6.9	-12.5	-82.4
Subsidies	000 EURO	11432	12737	11.4
Labour productivity	000 €/FTE	15.3	11.4	-25.2
Capital productivity	%	10.5	13.6	29.3

Figure 7.20.1: Employment and average annual salary: Spain



The most important species cultivated in Spain, according with their annual production, are mussel (*Mytilus galloprovincialis*), seabream (*Sparus aurata*), rainbow trout (*Oncorhynchus mykiss*), seabass (*Dicentrarchus labrax*), and turbot (*Psetta maxima*).

But there are other aquaculture species which are included in “Others” and they cannot be easily detected for the data user: They are different crustaceans cultivated in natural “esteros” and algae for human consumption cultivated in long lines.

Table 7.20.2: Main segments and economic indicators: Spain

Techniques		Seg 2.2	Seg 3.4	Seg 6.2	Seg 7.1
Species		Trout	Sea bass&sea bream	Other marine fishes	Mussel
Environment*		Freshwater	Saltwater	Saltwater	Saltwater
Number of enterprises	NUMBER	70.00	51.00	19.00	2066.00
Total sales volume	TONNE				
Turnover	000 EURO	41726.05	138459.92	46470.71	97721.86
Gross Added Value	000 EURO	14965.03	4043.55	20752.09	62771.60
EBIT	000 EURO	1906.57	-35115.69	8753.42	36014.59
Return on investment	%	5.83	-26.12	5.60	644.57
FTE	NUMBER	414.00	798.00	473.00	2276.00
Subsidies	000 EURO	715.12	2970.42	2211.11	269.55
Labour productivity	000 €/FTE	36.15	5.07	43.87	27.58
Capital productivity	%	45.78	3.01	13.28	1123.45
Running cost to turnover ratio	%	95.75	121.75	71.82	59.54
EBIT to turnover ratio	%	4.57	-25.36	18.84	36.85

Seg 2.2: Trout on growing

This segment represents the freshwater aquaculture in Spain, with the rainbow trout as nearly the only cultivated specie. There are establishments dedicated to this specie in nearly all the Spanish regions.

The number of companies dedicated to trout on growing represents the 2.25 % of Spanish companies and the FTE is the 6.64 %. The turnover, however, is nearly the 10 % in the total national.

The indicator Running cost to turnover ratio is better than the national average for the aquaculture sector.

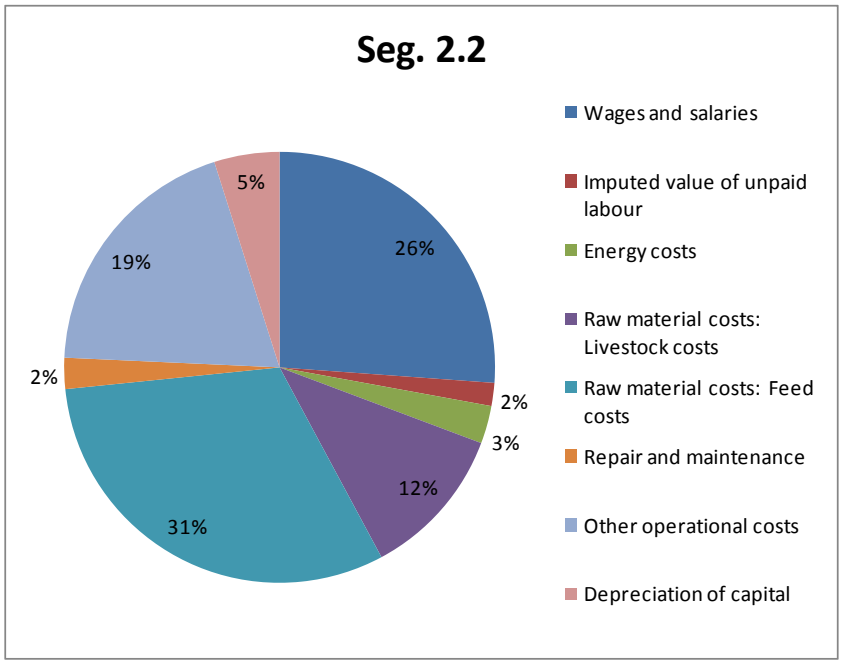
It must be taken into account that this specie whose finality is human consumption has been decreasing its production each year in the last decade. However the rise in the turnover is a 79 % comparing with the previous year. The reason is some companies have changed the segment they have been included in. Many of then used to cultivate eggs and now they begin their stages in juveniles, so that they have changed the segment.

Maybe in this case the analysis could be more precise if doing all the trout segments at the same time.

For the companies dedicated to the trout on growing sector, the feed costs represent the 31 % in the operational costs. The second cost is the item formed by wages and salaries (26 %); we must notice the unpaid labour hardly represents the 2 % in this sector. There is hardly self employed workers.

Other operational costs are important in this segment (19 %) but the livestock costs falls to the 11 %.

Figure 7.20.2: Operational costs structure for trout on growing: Spain



Seg 3.4: Sea bass & Sea bream cages

In this segment, the cultivated species are seabass, seabream and meagre. Comparing these three species, the seabass (*Dicentrarchus labrax*) has the highest production, the seabream (*Sparus aurata*) has half the production than the previous one and the meagre (*Argyrosomus regius*) reaches hardly the 10 % of the seabream production.

These species are cultivated in the East part of Spain, all along the Mediterranean coast.

This is a very important segment because of the total income; it represents nearly the 32 % of the total in Spain. And it has experimented a very important increase (52 % comparing with 2008).

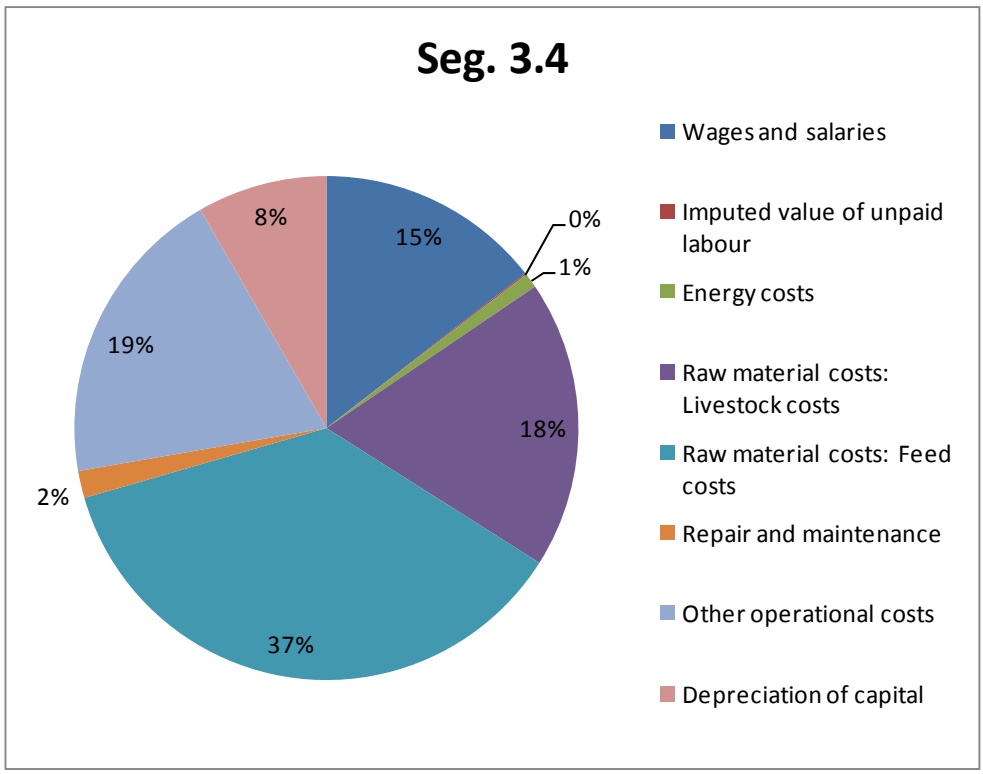
The number of companies included in this segment stands for the 1.64 % of Spanish companies and the FTE reaches the 12.8 %. So these companies have more employees as an average than in preceding segment.

The enormous increase in the depreciation in Spanish aquaculture is mostly due to this segment (3.5 million Euros in 2008 and 15 million Euros in 2009).

In this case the feed cost goes on being the most important cost as in the previous segment (37 %), and in this case the second cost is made up by other operational costs (19 %). Feed cost is very close (18 %).

In this segment there is not imputed value for unpaid labour, as the self- employed workers are not represented in this sector.

Figure 7.20.3: Operational costs structure for sea bream and seabass cages: Spain



Seg 6.2: Other marine fish on growing

This segment includes species like turbot (*Psetta maxima*), eel (*Anguilla Anguilla*), Senegalese sole (*Solea senegalensis*), mullets (Mugil spp.). The turbot is the most important specie in this segment, due to its production level and how it has been increasing in the last years. The companies dedicated to these fishes have a very high level of use of modern technology.

This segments signifies more than 10 % of the total sales in the Spanish sector and it holds with 19 enterprises in 2009, which is 0.9 % of every company in aquaculture. However, we must stress how this small number of companies generates a high gross added value of the national figure.

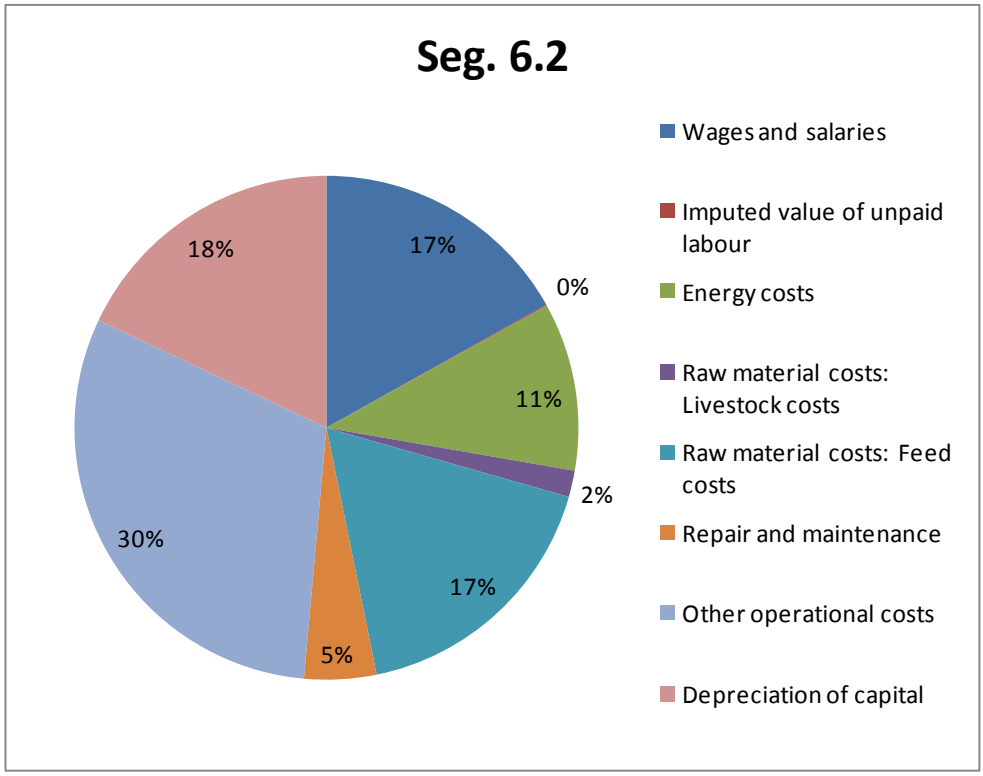
This is a segment which has not losses, with positive indicators and, in general and comparing both years (2008 and 2009), it progresses favourably.

It is also remarkable the high increase this segment has in the variable FTE (more than 141 %, comparing with 2008).

The other operational costs reaches 30 % in this segment, where the ratios are different from the previous segments. Here, depreciation is the 18 % of the costs, by far the highest ratio reached by depreciation in the Spanish aquaculture.

Wages and salaries and feed costs represent 17 % each item. As in previous segment there is not imputed value for unpaid labour

Figure 7.20.4: Operational costs structure for other marine fishes on growing: Spain



Seg 7.1: Mussel rafts

Mussel is the most produced species in Spain, reaching the 75 % of the national production for human consumption. It is mostly cultivated in Galicia, the North-West of Spain in rafts. We must

mention there are also rafts producing mussels in Mediterranean Sea (Cataluña, Valencia, Baleares) but these rafts represent just the 6 % in the national total.

The first value which attracts the attention is the high number of companies, 2,066, which represents the 66 % in Spain. Other value related to it is the FTE, just 2,276, very close to the figure of companies. It shows a structure in this segment composed mostly by natural person instead of legal person. Each of these small units owns less than 2 rafts, as an average.

The turnover represents the 22.2 % in the national amount, a very low figure with such a high production. There are no other incomes and the subsidies account for the 0.28 % of the total income (subsidies reached 2.7 %t of the total income in average for the Spanish aquaculture).

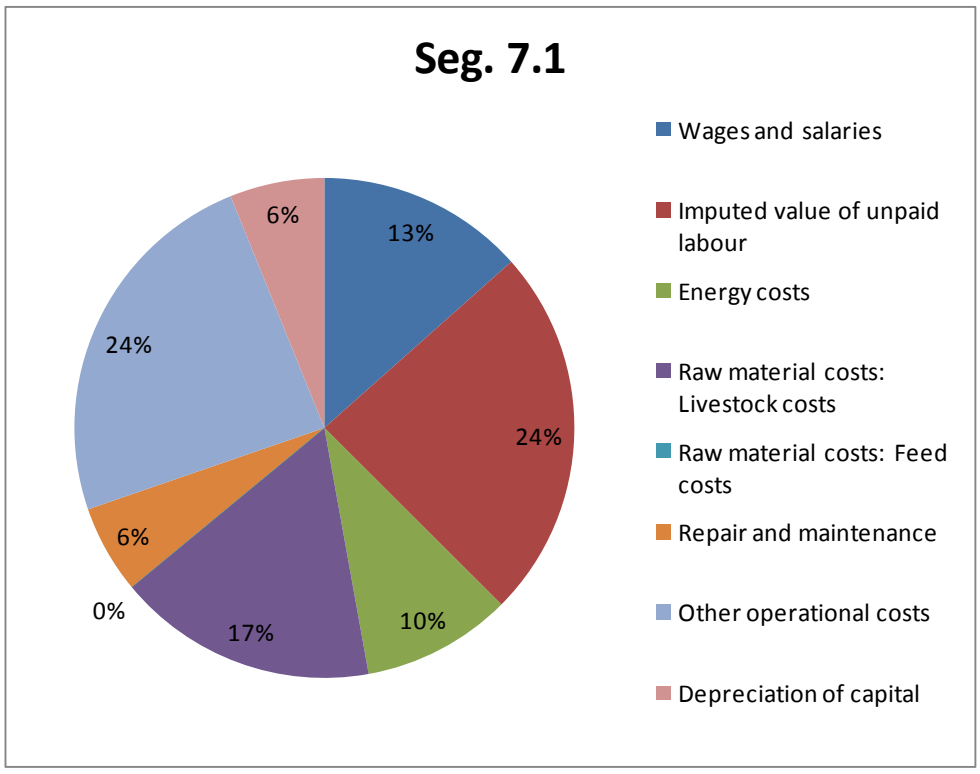
Anyway, the gross added value is very high in the national amount.

This sector has a different distribution of its costs as it is a completely different technique.

First of all, there is not feed costs. But the energy cost is very high, 10 % when the national ratio is 4 %, motivated overall for the fuel used in the auxiliary ships. The other operational costs get 24 % (higher than the national average).

Wages and salaries are just the 13 %, but it is remarkable the percentage of the imputed value for unpaid labour (24 % of the total cost). This is a sector with many self- employed workers and family enterprises. Depreciation of capital is similar to the national ratio.

Figure 7.20.5: Operational costs structure for mussels raft: Spain



7.20.2. Trends and triggers

An important topic in Spanish aquaculture is how the most **traditional ways** of aquaculture are successful. They are ways with a lower level use of technology, with low environmental impact and they are very important to create employment in the zones where they are situated.

We can find different examples of this traditional ways, like the clams cultivated in the intertidal areas; although they concentrate in Galicia, they spread along the Spanish coasts. Another important example of traditional aquaculture is the farming made in the “esteros” in Andalucía. The “esteros” are great masses of water which took part of saline mines. They have a very high natural productivity. Many of them are extensive ways of aquaculture and others are intensive, with artificial feed and young fishes coming from hatcheries. In the “esteros”, all the groups are cultivated:

- Fishes: seabass, seabream, meagre, sole…
- Crustaceans: prawns and shrimp
- Mollusc: clams..

At the present there are some initiatives to produce **organic production** in the "esteros"; these initiatives give an added value to the product. The benefits can increase with new marketing strategies. This product has a high quality level and alimentary security, using a collective brand "Pescado de estero".

The organic production in these esteros observes the best practices in environmental management and contribute to create new jobs in the area.

The techniques using **water recirculation systems** are being used in a small percentage of establishments, but this number is increasing at this moment.

This recirculation system permits recycling 99 % of the used water. This water is treated biologically in order to eliminate toxic metabolites. All the physic and chemical parameters are controlled to keep the fishes health. This system offers important advantages like isolating the used water from external factors.

Spain has a very diversified offer of aquaculture products, and at this moment, many groups and companies are experimenting with new species and techniques. The **supply of aquaculture products diversifies** with more species and more presentation for human consumption traditional supplies. For example, some companies have a stable production in egg for human consumption; it is caviar from sturgeons and rainbow trout. This product improves the offer for the consumer, offering products for gourmets.

Also macroalgae production for human consumption is increasing in the last years in Spain. Other species like blackspot seabream has got a stable production, which began with a small production in 2004 and now it is around 190 tonnes; pollack is being cultivated although

appeared some problems in the production system; also amberjack (Seriola spp.) is being grown in cages, with a small production at this moment.

In the group of mollusc, octopus is being grown in cages.

In 2010, the Spanish production suffered a general drop in their principal species. Marine fishes had a drop of 10 %, more or less; rainbow trout even more. This last species has been suffering a decrease during the last years.

For next years there are some threats for Spanish aquaculture:

- Competition with other territory uses (touristic uses, natural uses..)
- Difficulties to the access to financial resources
- Slowness in administrative processes
- The sector (and its organizational structures) is too fragmented
- There are some taxes which are not proportional with the environmental impact caused by the activity
- Restrictions in the use of resources for the feed
- A higher business competitiveness is necessary

In the other hand there are many positive aspects. Sector must take advantage of these aspects in the next years:

- There is a very consolidated trade chain and the aquaculture products demand is increasing
- Aquaculture products offer the possibility of supplying the markets with products with uniform quality during the whole year.
- In Spain there are R&D (I+D+i) groups with a very high qualification and capacity.
- Aquaculture offers economical welfare in the areas it develops.
- New markets and new consumption trends (quality brands, organical products, new presentation forced by new consumption habits…).
- There is an important supply of resources and knowledge in fishery sector. Possibility of taking advantage from them in aquaculture sector.

- Different uses from human consumption: raw material for other establishments, restocking, biotechnologies uses..)

7.20.3. Data coverage and Data Quality

Spain has two surveys directed to the aquaculture sector. In 1999 the Activity Survey started, in order to get information about the activity of the aquaculture establishments, specially the species production with the different techniques and the employment of the sector.

Recently, and as a consequence of Regulation (EC) No 199/2008, the Economic Survey for aquaculture sector started. It collects the economic information.

Both surveys are programmed and developed at the same time, using the same population to research and with a common field work. Each survey has its own questionnaire, getting information for different variables, except the value for the production (collected in both questionnaires). In this case, individual answers are checked and if there are inconsistencies, they are research and the found mistakes are corrected. So the consistency between both surveys is guaranteed.

Data are collected with combined methods; in a part of the population we use a census and in another part we use a stratified sampling.

As it is commonly known when the stratified sampling is used, when there is an important variation in the parameters collected, the number of answers can have an influence on the total values reported. This could explain the depreciation figure, which is much higher for 2009, as it was the number of answers in this specific question.

The segmentation used in Economic Survey uses a typology of aquaculture establishments which is coherent with the established groups in Commission Decision 2010/93/UE.

Anyway, this proposed stratification does not allow obtaining valid results for the whole population, in those cases in which is used the Probability sample survey and ask certain breakdowns, as in the following cases:

- **Turnover and "Income. "For species**". Each segment collects large groups of species (salmon, trout, sea bream, sea bass, common carp, etc...). Companies can belong to only one segment. However, they can grow and produce other different species. The random sample selection takes into account just the main specie (in volume). The stratums aren't representative of the species that are grown or produced. For this reason, there can be an important bias when you raise the sample results to the whole population.
- **Total sales volume**: In addition, in the template the volume must be measured in tonnes. The production for human consumption is measured in tonnes; however, different stages in life cycle (eggs or juveniles) are measured in quantities. It is really difficult to estimate a conversion factor between quantities to tons, because each establishment produces different size juveniles depending on the demand. That is the main reason, Spain has not provided data in DCF, because the end user can interpret the figure given in tonnes as the only production related with the total incomes provided. And this income is due to this production plus another production measured in quantities.
- **Raw material volume**: Feed: There is some data for feed collected in litres (feed used in mollusc hatcheries and nurseries…).

7.21. SWEDEN

7.21.1. Overview of the sector

The Swedish fishery sector including the fleet, aquaculture and processing industries employs around 4,000 individuals and stands for about 0.1 % of GDP in Sweden. A small share regarded from a national perspective. Regarded from a local and regional perspective theses sectors provide an important supply of labor in areas whith few alternative job opportunities. The Swedish aquaculture sector is small in relation to the total national fishery sector. Of the total production of fish for consumption aquaculture production represented about 3 % of the total volume and 25 % of the value (in 2008). The aquaculture sector in Sweden is spatially distributed across the country and fishholdings are established in 100 out of 290 regions. Natural prerequisites and a large supply of appropriate freshwater areas have resulted in a sector that consist of several different clusters with different species and markets. Aquaculture in Sweden is a distinct rural industry and most enterprises are locted in sparseley populated areas. Thereby, the aquaculture sector in Sweden have an important socio-economic dimension as it contributes to employment in rural areas.[1]

Over the last decade the Swedish aquaculture sector has experienced a structural change towards consolidation and streamlining. Over the period 1998 to 2009, the production levels ranged from 5 500 tonnes (in 1998) to 10 363 tonnes (in 2009). Meanwhile, the value of total production increased from 14.5 million Euros in 1998 to 29 million Euros in 2009. During the same period, there was a decline both in number of enterprises and number of persons employed, indicating a trend towards clustering of smaller farms and enterprises to larger units. In 2009 the majority of production took place amongst a few large firms. The four largest accounted for almost 50 per cent of the total value of aquaculture production in Sweden. Moreover, there have been variations in the volume and value of production between segments. Marine production had its peak in 1996, when a total of 2 900 tonnes were produced at a value of 6.7 million Euros and

[1] National Strategic Plan for the fisheries sector 2007-2013.

reached its lowest level in 2003 at 1 300 tonnes, corresponding to a value of 3.3 million Euros[2]. However, since 2003 both the volume and value of marine aquaculture has been increasing steadily although not reaching the figures recorded in the beginning of the period.[3]

In 2009, the latest year for available data, the total sales volume of aquaculture production in Sweden was 10 363 tonnes with a value of 29 million Euros. Around 70 % of the total production volume was fish for consumption with a value of 22 million Euros. Around 80 % of the total aquaculture production consisted of freshwater fish. The total number of aquaculture enterprises was 192 and the total number of persons employed 424. The dominating species was rainbow trout representing 89 % of all fish produced for consumption purposes. The total production of fish for stocking including crayfish for stocking was 993 tonnes, and a total of 2 125 tonnes of Blue mussels were produced.

Table 7.21.1: Economic Performance at national level: Sweden

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	155	192	23.9
Total sales volume	TONNE	8887	10363	16.6
Turnover	000 EURO	34457	29383	-14.7
FTE	NUMBER	222	222	-0.3
Gross Added Value	000 EURO	10896	13612	24.9
EBIT	000 EURO	5176	10767	108.0
Return on investment	%	11.1	30.9	176.9
Subsidies	000 EURO	2549	3210	26.0
Labour productivity	000 €/FTE	49.0	61.5	25.3
Capital productivity	%	23.5	39.0	66.3

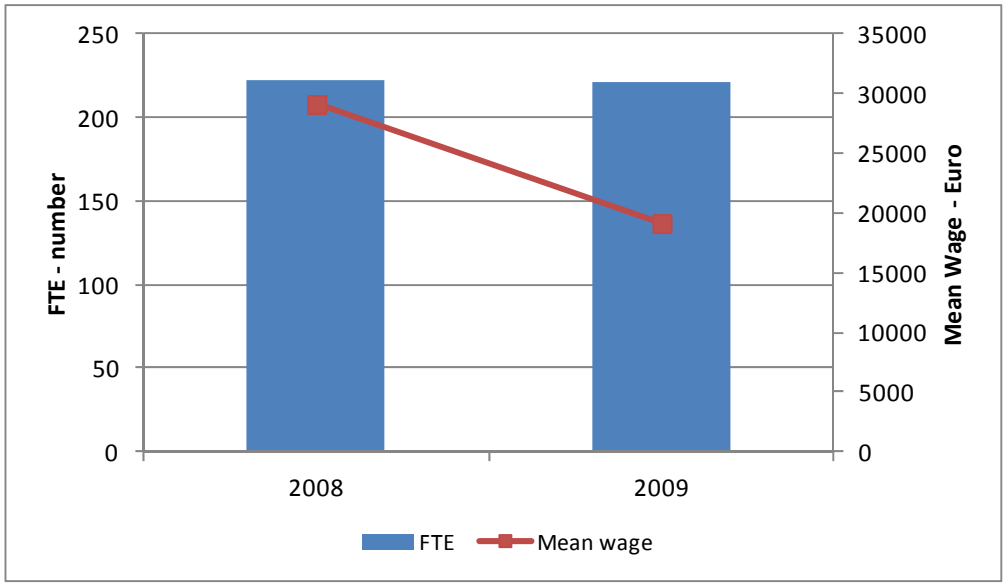
During 2008-2009 the aquaculture sector in Sweden has grown in terms of number of enterprises, and total sales volume (Table 7.21.1). The number of enterprises increased from 155 to 192 and the number of persons working in the aquaculture sector increased from 379 to 424 persons. The sector is heavily dominated by male workers. In 2008 almost 93 % of the employees were male; the corresponding share for 2009 was 86 %.

[2] The Swedish Agency for Marine and Water Management.
[3] During the period 1996 to 1999, only data on fish for consumption were collected. Since fish for stocking purposes is mostly produced in fresh water, this mainly affects the times series for fresh water production.

During 2008-2009, total sales volume increased with 17 %, gross value added increased with 25 % and earnings before interest and tax (EBIT) increased by 108 %. Turnover decreased by 15 % and the number of full time equivalent workers (FTE) remained stable around 222 persons. Table 7.21.1 also shows that returns on investments (ROI) increased by 177 %, and that both labour and capital productivity increased by 25 and 66 %, respectively. Implying an increase in both the average output per unit of capital and the gross value added to the economy per FTE.

During the period 2008-2009 the total amount of subsidies to the aquaculture sector increased by 26 % from 2.5 million Euros to 3.2 million Euros.

Figure 7.21.1: Employment and average annual salary: Sweden



7.21.2. Structure and economic performance of the sector's main segments

The aquaculture sector in Sweden consists of three dominating segments. These main segments and their economic indicators are presented in Table 7.21.2.

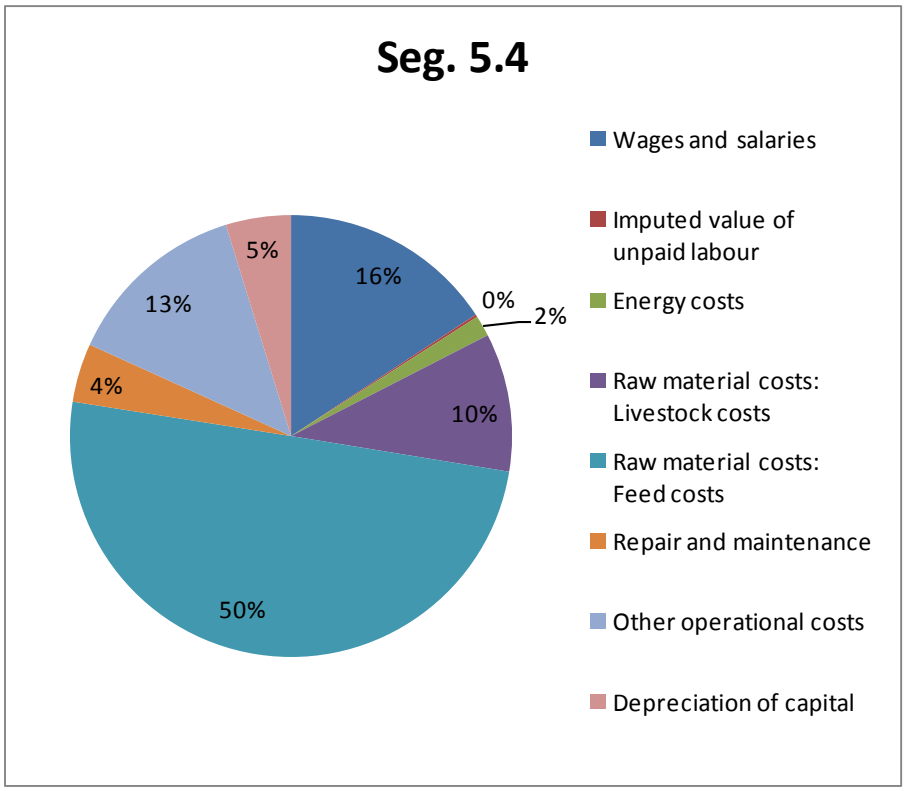
Table 7.21.2: Main segments and economic indicators: Sweden

Techniques		Grown in combination (Segment 5.3)	Grown in cage (Segment 5.4)	Long-lines and ponds (Segment 10.4)
Species		Rainbow trout Arctic char	Rainbow trout Arctic char	Blue mussels Oysters Crayfish
Environment*		Freshwater	Freshwater	Freshwater/Salt water
Number of enterprises	NUMBER	54	63	48
Total sales volume	TONNE	1369	6604	2128
Turnover	000 EURO	8275	18095	1118
Gross Added Value	000 EURO	2849	9302	763
EBIT	000 EURO	1042	6951	2507
Return on investment	%	11.9	34.0	56.5
FTE	NUMBER	55	113	22
Subsidies	000 EURO	236	285	2689
Labour productivity	000 €/FTE	51.8	82.3	35.5
Capital productivity	%	32.4	45.5	17.2
Running cost to turnover ratio	%	82.5	67.0	73.8
EBIT to turnover ratio	%	12.6	38.4	224.3

* Saltwater, Freshwater

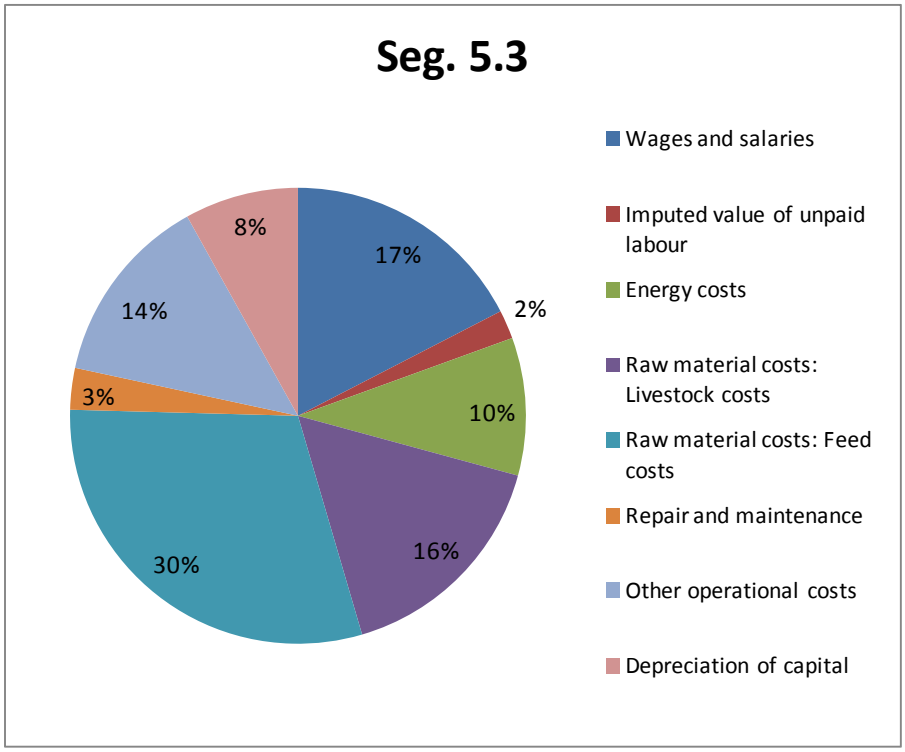
In 2009, rainbow trout and arctic char grown in cages was the largest segment both in terms of total production volumes, turnover, gross value added and the number of enterprises. The total production volume was 6 604 tonnes and the segment had a turnover of 18 million Euros. Gross value added was 9.3 million Euros and there were 63 enterprises in this segment with an average production of 105 tonnes per enterprise, and a total of 113 FTEs. The production of Rainbow trout was the dominating species and amounted to nearly 97 % of production in this segment. Rainbow trout is mainly raised for food production and accounted for 89 % of the total fish produced for consumption in Sweden (in 2009). During the period 2008-2009, the production of rainbow trout increased with 11 %. In addition this segment generates the highest value added to the economy both in terms of per unit of capital and per FTE (45.5 % and 82.3 %, respectively).

Figure 7.21.2: Operational costs structure for Rainbow trout and Arctic Char in cages: Sweden



The second largest segment is Rainbow trout and Arctic char grown in combination (Table 7.21.2). In 2009, this segment produced a total volume of 1 369 tonnes and had a turnover of 8.3 million Euros. There were 54 enterprises in this segment and the number of FTEs was 55. The economic indicators of this segment indicate profitability in terms of both labour and capital. EBIT accounts for almost 1 million Euros and labour and capital productivity for 52 thousand Euros per FTE and 32 %, respectively.

Figure 7.21.3: Operational costs structure for Rainbow trout and Arctic Char combined (hatcheries & nurseries and on growing): Sweden

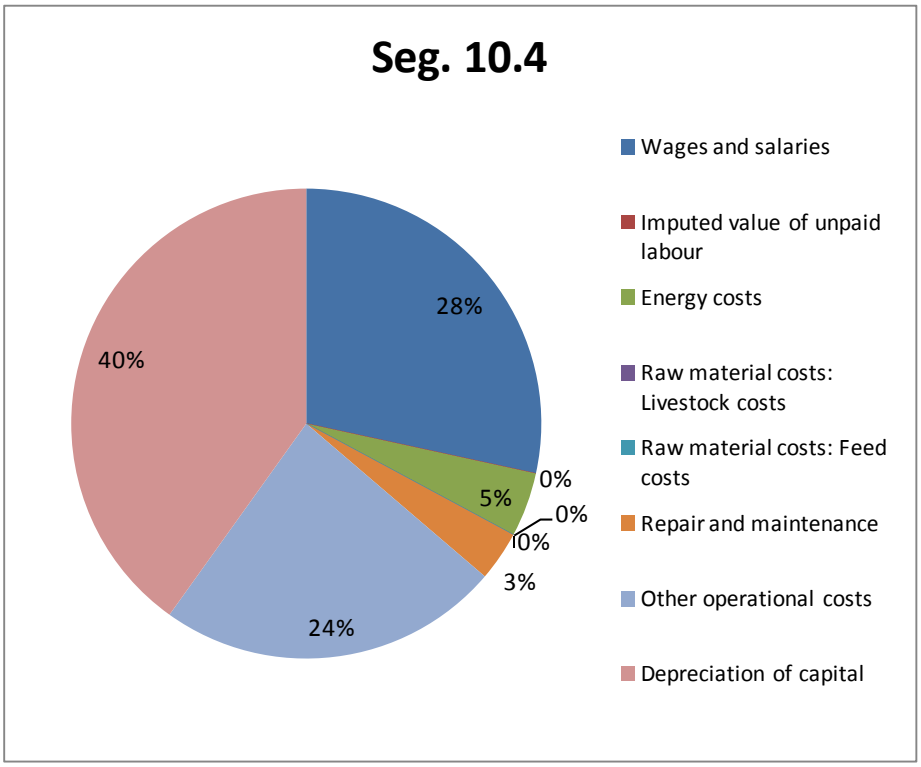


The third largest segment is other shellfish including blue mussels, oysters (*ostrea edulis*, *crassostrea gigas*) and crayfish (*astacus astcus* and *pacifastacus leniusculus*).

In 2009, there were 48 enterprises producing a total of 2 128 tonnes of shellfish with a value of 1.1 million Euros. The production of blue mussels is dominating within this segment, but there is a large variation in the production of mussels from year to year due to periodic/seasonal breaks in the production. During the period 2008-2009 the production of Blue mussels increased by from 1 911 to 2 125 tonnes. Considering that this segment has the highest return on investment (57) this could indicate that investments (mainly undertaken in 2007 and 2008) in production sites for mussels (including one oyster hatchery) have a positive effect on the volume of production. In 2009 this segment received almost 84 % the total amount of subsidies paid out to aquaculture in Sweden (2.7 million Euros). Apart for human consumption, part of the production

of Blue mussels could be used as organic fertilizers or as organic fodder. Hence, these high levels of subsidies indicate that The Swedish Operational Programme has given priority to measures and production techniques that reduce the environmental impact, particularly investments that enhance the production of Blue mussels.

Figure 7.21.4: Operational costs structure for Other shellfish (blue mussels, oysters and crayfish) in long-lines and ponds: Sweden



In summary the economic indicators of aquaculture production in Sweden indicate that the production of Rainbow trout and arctic char grown in cages have the highest profitability and value added for the economy followed by the production of shellfish (particularly Blue mussels). Moreover, rainbow trout and arctic char grown in combination suffer with low profitability and low productivity.

7.21.3. Trends and triggers

Aquaculture in Sweden has a large potential for further development. At the same time there is a clear political goal to expand the sector in line with the increasing demand for locally produced, gastronomic and environmentally sustainable food. A lot of projects and investments are undertaken in the Swedish aquaculture sector, particularly projects that explore the potential of marine aquaculture.

In addition, the possibility of blue mussels to be farmed on the basis of environmental concerns is discussed in several reports as mussels absorb nutrients from the water and thereby reduces some of the negative external effects of e.g. agricultural production. In this view, the production of mussels has an important environmental aspect. Recent interest in mussel production as a method of reducing nitrogen levels has resulted in several investments that create a system for mussel producers whereby they can be compensated by either the state or by farmers who are emitting nitrogen to the sea. Within this framework, it has also been put forward that the mussels produced, could be used as an organic fertilizer or as organic fodder, apart from human consumption.

There are some incentives for new developments in the aquaculture sector in the way of structural support from the European Fisheries Fund (EFF). The Swedish Operational Programme gives priority to measures increasing profitability, new production techniques, new techniques that reduce the environmental impact and measures in the field of preventing damage caused by wild predators (seals etc.). In the first call for applications, which included applications submitted up until 30 June 2008, applications relating to aquaculture exceeded the budget available by a factor of two. Applications cover a wide range of activities and segments, but the majority of applications concern increased production of arctic char and blue mussels.

7.21.4. Data coverage and Data Quality

The Swedish Agency for Marine and Water Management (previously The Swedish Board of Fisheries) was responsible for compiling and reporting statistics on the aquaculture sector for the

reported period. The Swedish Agency for Marine and Water Management in cooperation with Statistics Sweden conducted an income tax declaration survey and a questionnaire for each year.

The income tax declarations survey includes every enterprise whose main source of income (more than 50 %) came from aquaculture (EUROSTAT definition under NACE Code 03.2 “Fish farming”). The questionnaire was concerning farming techniques, investments, production value and volume and was sent to all aquaculture farms. The purpose of this survey was to provide additional information in order to enable a clustering of farming units to enterprises in cases when several farming units are equal to one fiscal enterprise. This method also makes it possible to compare information on value of aquaculture production with declared income from income tax declarations. These comparisons are needed to determine whether aquaculture farming is the main activity of the enterprise or not. On top of this, every third year a questionnaire are sent to a sample of the aquaculture enterprises in order to create a cost allocation key for costs that are not specified in the income tax declaration. This is a non-probability survey.

Data on subsidies was collected from The Swedish Agency for Marine and Water Management, the managing authority of the European Fisheries Fund (EFF), and compiled by Statistics Sweden. Lastly, in order to identify the segments, companies using more than one farming technique or growing more than one species, all production, incomes and costs were transferred to the main technique and main species based on turnover.[4] Data on aquaculture production is reported from the Swedish official statistics to Eurostat. Hence, the volume of production as reported by Eurostat should coincide with volumes reported in Swedish official statistics. However, disparities can occur due to updates in the data mainly due to changes in the number of active enterprises.

[4] Source: The Swedish Agency for Marine and Water Management

7.22. UNITED KINGDOM

7.22.1. Overview of the sector

By far the biggest sector for aquaculture in the UK is production of salmon, which is highly commercialized and owned by various large companies. The bulk of salmon production is in Scotland and the Scottish Government produces an annual report covering many aspects. ("Scottish Fish Farm Production Survey 2009 Report", Marine Scotland 2010 http://www.scotland.gov.uk/Resource/Doc/295194/0106192.pdf).

The next sector is trout, grown for direct harvesting for the table and for stocking fisheries from which anglers take for consumption. Trout production is widespread throughout the UK with both larger companies and individual producers. National figures for the UK are compiled by Cefas. (Finfish News 11, http://cefas.defra.gov.uk/publications/finfishnews).

Several other finfish species are farmed on a very small or experimental scale, in systems ranging from simple ponds to high-tech facilities. The economics of such systems may depend on very local factors (i.e. redundant buildings, sources of waste heat). See editions of Finfish News (op cit) for examples.

Shellfish are grown in inter-tidal and offshore systems. In addition to well-defined farms, there are activities where an area of seabed is licensed for protected exploitation; enhancing or promoting the stock in this area to increase the harvest is a type of ranching and should be reported as farming rather than wild-catch. The exact classification of each area and the need to avoid multiple counting both require care.
(Shellfish News 30 http://cefas.defra.gov.uk/publications/shellfish-news).

There is almost no direct harvesting of farmed crustaceans in the UK, but lobster hatcheries take in wild females and grow the eggs into juveniles that are returned to the wild. This makes an

important contribution to maintaining a sustainable take, with potential added value of tourism and promoting interest in consumption.

Using the UK aquaculture production figures and best-estimate unit values for 2009, as submitted to EUROSTAT, salmon (segment 1.2) accounted for 74 % of volume and 86 % of value; trout (Rainbow & Brown; segment 2.3) for 8 % of volume and 8 % of value; and mussels (segment 7.1, 7.2, 7.3 combined) for 16 % of volume and 4.5 % of value. All the remaining species may be considered niche or experimental products and add up to less than 2 % of turnover value.

Table 7.22.1 shows figures derived from the UK Office of National Statistics Annual Business Index survey (ONS ABI) that covers all industries. A contraction of 32 % in UK aquaculture turnover between 2008 and 2009 is, however, not believable and did not happen. It was reported because Aquaculture is a very small sector and subject to large sampling errors. This effect was then exaggerated by the change in the pound to Euro conversion (1.2588 for 2008 and 1.1233 for 2009).

Table 7.22.1: Economic Performance at national level: United Kingdom

variable	unit	2008	2009	% Change
Number of enterprises	NUMBER	531	442	-16.8
Total sales volume	TONNE			
Turnover	000 EURO	647000	439000	-32.1
FTE	NUMBER	6000	6000	0
Gross Added Value	000 EURO			
EBIT	000 EURO			
Return on investment	%			
Subsidies	000 EURO	0	0	
Labour productivity	000 €/FTE			
Capital productivity	%			

Volume produced actually increased between 2008 and 2009, from 180,000 tonnes in 2008 (Finfish News 9) to 197,000 tonnes in 2009.

The number of enterprises is shown as decreasing by 17 % between 2008 and 2009. This is also a misrepresentation. There has been a process of consolidation over the past decade and both the number of enterprises and number of sites are needed to describe trends in the size of the industry. All aquaculture producers have to be licensed and the number of licences gives a more accurate picture of trends.

Similarly, the large reductions of assets and costs do not reflect an actual change in number or character of enterprises.

Production data in England and Wales is collected from sites rather than enterprises. From the Scottish report (op cit) it is apparent that a different relationship between enterprises and sites is found between the salmon and trout producers. The estimate of 442 enterprises (from ABI) covering 800 sites (from production returns) appears realistic. If anything, it is biased too high but the extent of bias is not currently estimable. Of 442 enterprises, the number employing more than ten staff was estimated as 50, most of which are producing salmon.

By comparison with the production volumes and values submitted to Eurostat, it would seem that the 2008 estimates from the ABI are more true to the situation. The former turnover value (541 million Euros in 2009) is for table production only. Eurostat asks for volume but not value of hatcheries. Adding a value for those would easily raise the turnover to the 647 million Euros extrapolated from the ABI. UK production here excludes the ornamental sector, as this is highly integrated with the companion animal trade and importation of live fish. This exclusion should be continued as there is no merit in confounding statistics on food production with those for the pet trade. However, the ABI figure may include some ornamentals.

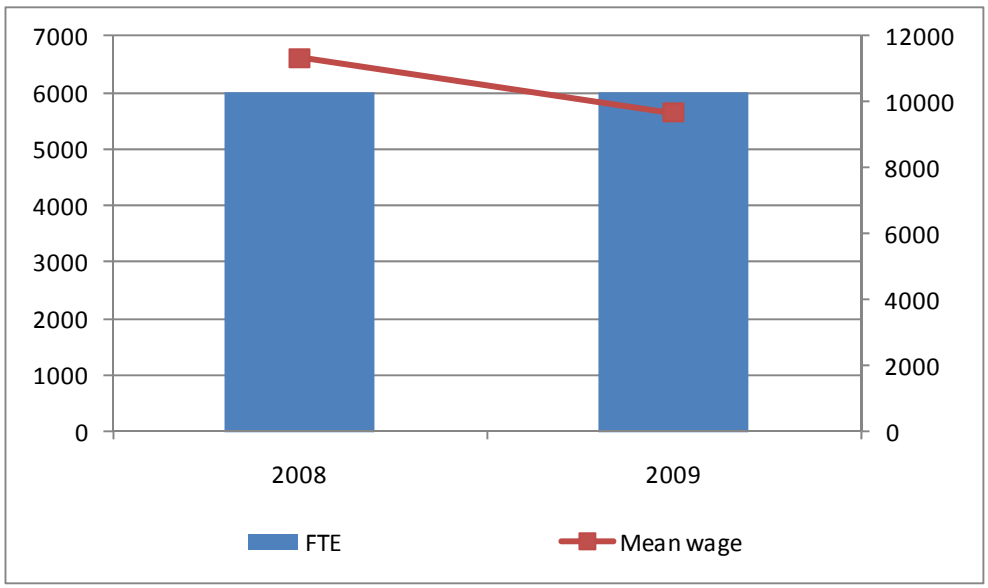
The value for wages and salaries derived from the ABI of 58 million Euros has been used to derive a mean wage of 11.3 thousand Euros in 2008 and 9.7 thousand Euros in 2009. This is based on the ABI extrapolation of 6,000 staff used for both years. Figures collected from farms suggest direct employment of approximately 3,000 staff, but this may under-estimate “office” staff for multi-farm businesses. The true figure for those taking an income from aquaculture in the UK probably lies between the two. The true mean wage is therefore higher than calculated

and the data do not reliably indicate a trend. Use of unpaid labour is probably very small. The tables also show all employees as male. This is incorrect and no gender breakdown should be inferred.

The ABI figures for staff costs should include national insurance (NI) and other overheads. It is unlikely that aquaculture firms operate company pension schemes but they must pay NI except for casual employees.

In relation to segmenting the economic data, the breakdown derived from turnover would not apply to capital and cost figures, as the three main sectors rely on very different technologies.

Figure 7.22.1: Employment and average annual salary: United Kingdom



7.22.2. Structure and economic performance of the sector's main segments

Table 7.22.2: Main segments and economic indicators: United Kingdom

Techniques		total
Species		
Environment*		
Number of enterprises	NUMBER	442
Total sales volume	TONNE	
Turnover	000 EURO	439000
Gross Added Value	000 EURO	
EBIT	000 EURO	
Return on investment	%	
FTE	NUMBER	6000
Subsidies	000 EURO	0
Labour productivity	000 €/FTE	
Capital productivity	%	
Running cost to turnover ratio	%	78.4
EBIT to turnover ratio	%	

Salmon are grown in seawater in cages off the coast of Scotland and a small amount in Northern Ireland. Eggs are produced locally from broodstock and also both imported and exported. Some salmon smolt are produced in northern England and transferred to Scotland. Salmon production is highly commercialized through large companies. (Scottish Fish Farm Production Survey 2009, http://www.scotland.gov.uk/Resource/Doc/295194/0106192.pdf).

Trout production is dominated by rainbow trout grown from hatchery stock; the species does not breed readily under natural conditions in the UK. Brown trout is a minor component, bred as diploid stock for reinforcing natural populations, and as triploid for stocking for recreational angling without risk of interbreeding. Trout are grown in flow-through systems and still freshwaters and, to a small extent, in sea-cages. Trout production is widespread throughout the UK with both larger companies and individual producers. (Finfish News 11, http://cefas.defra.gov.uk/publications/finfishnews).

Mussels are grown on the bottom or, increasingly, on ropes suspended from rafts or from floated supports. Stock are taken explicitly from natural mussel beds by dredging or are captured passively from plankton. Pacific (rock) oysters and flat (native) oysters are a small volume sector with a premium value. Oysters are bred in hatcheries and traded internationally. Some cockle production from “several areas” (several meaning “cut off”) is counted as aquaculture.

The economic indicators shown in Table 7.22.2 are incomplete, due to missing data. However, Marine Harvest have published a cost breakdown for Scottish salmon indicating salary as 7.2 % with the largest cost feed at 40 % (http://marineharvest.com/). Comparable tables for trout and mussels are not currently available. These sectors may be assumed to be less capital intensive. It was announced in Finfish News 11 in relation to Reg 199/2008 that, “In the future, we may need to collect additional data directly from the industry to fulfil this regulation.”

7.22.3. Trends and triggers

Plans for the development of aquaculture have been published for Scotland (http://www.scotland.gov.uk/Resource/Doc/234472/0064204.pdf) and are currently in draft for England (Defra, in prep).

Aquaculture is seen as contributing to the sustainable supply of healthy food and as a route to mitigation of environmental impact due to the taking of wild stocks. It is also an important sector contributing to rural economies though employment and the multiplier effect. Fish farming or creation of recreational fishing are possibilities for diversification in farming.

Aquaculture currently receives no direct subsidies but some disease control, sanitary inspections, control of alien species, and research are carried out as public functions. Challenges to current monoculture systems include disease control (viruses, bacteria and parasites), availability of water (under freshwater abstraction controls and marine water-quality measures), and the integration into spatial planning, not least to meet environmental and welfare concerns of the

general population. Expansion or introduction of new species may require both innovative technologies and the development of new consumer enthusiasms. Energy-intensive systems, especially those using heated water, are likely to be uncompetitive with other countries with warmer climates. Proof of concept and promotion in a local or fashion-led market are not sufficient to suggest capacity to scale up. Indigenous production of tilapia is currently being expanded, from a tiny base.

Consumption of fish is encouraged by the UK government (i.e. http://www.nhs.uk/Livewell/Goodfood/Pages/eight-tips-healthy-eating.aspx; and http://www.food.gov.uk/foodindustry/farmingfood/fish/). A media campaign led by celebrity chefs to highlight good and bad fishing practices (http://www.fishfight.net/ "Hugh's fish fight") engendered considerable press and public interest. Consumption is still well below the recommended level ("People in Britain each consume about 20kg of fish per year. That's only half of what a Spaniard eats, and three times less than a Portuguese" http://www.guardian.co.uk/environment/2011/jan/28/sustainable-fish) but another health message is that people in the UK generally overeat, so the advice would be to replace another food with fish. Attitudes to farmed fish are also ambiguous, based on conservation grounds (http://www.greenpeace.org.uk/oceans/what-you-can-do/better-buys-what-fish-can-I-eat "Be wary of farmed fish"), health scares alleging links to toxins, carcinogens and radioactivity, and the perception that farmed salmon flesh is gastronomically inferior to wild.

It appears that current trends putting greater reliance on aquaculture rather than wild-harvest can continue, and that consumers can be interested in new products but that this is best carried out as a gradual process without an expectation of immediate step changes.

7.22.4. Data coverage and Data Quality

Production data from UK aquaculture is based on complete censuses and is believed to be accurate as cooperation between farmers and the ministry agencies is amicable. Economic data derived from the ABI sample survey is unreliable due to sampling variation and is limited to the larger firms. It was estimated as Eurostat quality level 2 - +/-25 % with 95 % confidence. It is apparent that for future years the data must be collected explicitly from the major segments to

establish the validity and precision in each.

Production data for the UK is submitted to Eurostat and published in Finfish News and Shellfish News (www.cefas.co.uk). Scottish salmon and trout production is reported in much more detail in annual reports (http://www.scotland.gov.uk/Topics/marine/Fish-Shellfish). ABI data is available on the statistics.gov.uk website (http://www.ons.gov.uk/ons/about-ons/who-we-are/services/unpublished-data/business-data/abi/abi-faqs/index.html).

Restricting the economic reports to the three major segments leads to no issues of confidentiality as individual firms will not be apparent.

8. GLOSSARY

The economic variables to be collected for the aquaculture industry sector under the Data Collection are specified in section A of Chapter IV and in Appendix X and XI of Commission Decision 2008/949/EC of the 6th of November 2008, on adopting a multiannual Community programme pursuant to Council Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy. Meanwhile a new Commission Decision came into force, namely, 2010/93/EU, regulating the data collection for the aquaculture sector for the years 2011-13.

Table 8.1: List of economic variables for the aquaculture sector

Variable group	Variable	Unit
Income	Turnover	EUR
	Subsidies	EUR
	Other income	EUR
Personnel costs	Wages and salaries	EUR
	Imputed value of unpaid labour	EUR
Energy costs	Energy costs	EUR
Raw material costs	Livestock costs	EUR
	Feed costs	EUR
Repair and maintenance costs	Repair and maintenance	EUR
Other operational costs	Other operational costs	EUR
Capital costs	Depreciation of capital	EUR
	Financial costs, net	EUR
Extraordinary costs, net	Extraordinary costs, net	EUR
Capital value	Total value of assets	EUR
Net Investments	Net Investments	EUR
Debt	Debt	EUR
Raw material volume	Livestock	Tonne
	Fish feed	Tonne
Volume of sales	Volume of sales	Tonne
Employment	Number of persons employed	Number
	FTE National	Number
Number of enterprises	Number of enterprises	Number

8.1. Glossary of data requested and indicators

Parameters requested

Turnover

"Turnover" comprises the totals invoiced by the observation unit during the reference period, and this corresponds to market sales of goods or services supplied to third parties.

Turnover includes all duties and taxes on the goods or services invoiced by the unit with the exception of the VAT invoiced by the unit vis-à-vis its customer and other similar deductible taxes directly linked to turnover.

It also includes all other charges (transport, packaging, etc.) passed on to the customer, even if these charges are listed separately in the invoice. Reduction in prices, rebates and discounts as well as the value of returned packing must be deducted. Income classified as other operating income, financial income and extraordinary income in company accounts is excluded from turnover. Operating subsidies received from public authorities or the institutions of the European Union are also excluded (Structural Business Statistics (SBS) Code 12 11 0, Commission Regulation (EC) No 2700/98).

Subsidies

"Subsidies" are the financial assistance received from public authorities or the institutions of the European Union which are excluded from turnover.

It includes direct payments, e.g. compensation for stopping trading, refunds of fuel duties or similar lump sum compensation payments; excludes social benefit payments and indirect subsidies, e.g. reduced duty on inputs such as fuel or investment subsidies.

Other income

"Other income" refers to other operating income included in company accounts which are excluded from turnover; income coming from other activities than aquaculture, e.g. the licensing of ponds for recreational fishery purposes.

Wages and salaries

“Wages and salaries” is equivalent to “Personnel costs” on the Structural Business Statistics.

“Personnel costs” are defined as the total remuneration, in cash or in kind, payable by an employer to an employee (regular and temporary employees as well as home workers) in return for work done by the latter during the reference period. Personnel costs also include taxes and employees' social security contributions retained by the unit as well as the employer's compulsory and voluntary social contributions.

Personnel costs are made up of:

- wages and salaries
- employers' social security costs

All remuneration paid during the reference period is included, regardless of whether it is paid on the basis of working time, output or piecework, and whether it is paid regularly or not. Included are all gratuities, workplace and performance bonuses, ex gratia payments, thirteenth month pay (and similar fixed bonuses), payments made to employees in consideration of dismissal, lodging, transport, cost of living and family allowances, commissions, attendance fees, overtime, night work etc. as well as taxes, social security contributions and other amounts owed by the employees and retained at source by the employers. Also included are the social security costs for the employer. These include employer's social security contributions to schemes for retirement pensions, sickness, maternity, disability, unemployment, occupational accidents and diseases, family allowances as well as other schemes. These costs are included regardless of whether they are statutory, collectively agreed, contractual or voluntary in nature. Payments for agency workers are not included in personnel costs. (Structural Business Statistics (SBS) Code 13 31 0, Commission Regulation (EC) No 2700/98).

Wages and salaries: Wages and salaries are defined as "the total remuneration, in cash or in kind, payable to all persons counted on the payroll (including homeworkers), in return for work done during the accounting period." regardless of whether it is paid on the basis of working time, output or piecework and whether it is paid regularly or not. Wages and salaries include the values of any social contributions, income taxes, etc. payable by the employee even if they are actually withheld by the employer and paid directly to social insurance schemes, tax authorities, etc. on behalf of the employee. Wages and salaries do not include social contributions payable by the employer. Wages and salaries include: all gratuities, bonuses, ex gratia payments, "thirteenth month payments", severance payments, lodging, transport, cost-of-living, and family allowances, tips, commission, attendance fees, etc. received by employees, as well as taxes, social security contributions and other amounts payable by employees and withheld at source by the employer. Wages and salaries which the employer continues

to pay in the event of illness, occupational accident, maternity leave or short-time working may be recorded here or under social security costs, depending upon the unit's accounting practices. Payments for agency workers are not included in wages and salaries. (Structural Business Statistics (SBS) Code 13 32 0, Commission Regulation (EC) No 2700/98).

Social security costs: Employers' social security costs correspond to an amount equal to the value of the social contributions incurred by employers in order to secure for their employees the entitlement to social benefits. Social security costs for the employer include the employer's social security contributions to schemes for retirement pensions, sickness, maternity, disability, unemployment, occupational accidents and diseases, family allowances as well as other schemes. Included are the costs for all employees including homeworkers and apprentices. Charges are included for all schemes, regardless of whether they are statutory, collectively agreed, contractual or voluntary in nature. Wages and salaries which the employer continues to pay in the event of illness, occupational accident, maternity leave or short-time working may be recorded here or under wages and salaries, dependent upon the unit's accounting practices. (Structural Business Statistics (SBS) Code 13 33 0, Commission Regulation (EC) No 2700/98).

Imputed value of unpaid labour

Unpaid workers normally refers to persons who live with the proprietor of the unit and work regularly for the unit, but do not have a contract of service and do not receive a fixed sum for the work they perform. This is limited to persons who are not included on the payroll of another unit as their principal occupation.

Thus, imputed value of unpaid labour estimates the value of the salaries that these unpaid workers would have received if their work was remunerated.

The chosen methodology to estimate this imputed value of unpaid labour should be explained by the Member State in their national programme.

Energy costs

“Energy costs” corresponds to the “Purchases of energy products (in value)” on the Structural Business Statistics.

Purchases of all energy products during the reference period should be included in this variable only if

they are purchased to be used as fuel. Energy products purchased as a raw material or for resale without transformation should be excluded. This figure should be given in value only. (Structural Business Statistics (SBS) Code 20 11 0, Commission Regulation (EC) No 2700/98).

Livestock costs

Livestock costs considers the purchasing costs of the livestock during the reference period. The variable for livestock costs should correspond to the variable for livestock volume.

On the Structural Business Statistics it is included inside 13 11 0 “Total purchases of goods and services”.

Feed costs

Feed costs considers the purchasing costs of the feed during the reference period. The variable for feed costs should correspond to the variable feed volume.

On the Structural Business Statistics it is included inside 13 11 0 “Total purchases of goods and services”.

Repair and maintenance

Under repair and maintenance there should be included the costs incurred to bring an asset back to its earlier condition or to keep the asset operating at its present condition (as opposed to improving the asset).

On the Structural Business Statistics is included inside 13 11 0 “Total purchases of goods and services”.

Other operational costs

Other operating costs should comprise outsourcing costs, property or equipment rental charges, the cost of raw materials and supplies that cannot be held in the inventory and have not been already specified (i.e. water, small items of equipment, administrative supplies, etc.), insurance premiums, studies and research costs, external personnel charges, fees payable to intermediaries and professional expenses, advertising costs, transportation chages, travel expenses, the costs of meetings and receptions, postal charges, bank charges (but not interest on bank loans) and other items of expenditure.

On the Structural Business Statistics is included inside 13 11 0 “Total purchases of goods and services”.

Depreciation of capital

Depreciation refers to the decline in value of the assets. In accounting, it is used as the allocation of the cost of tangible assets to periods in which the assets are used, in order to reflect this decline in their value.

The chosen methodology to allocate these costs over periods should be explained in the national programme. ESA (6) 6.02 to 6.05 European System of Accounts 1995 (Regulation (EC) No 2223/96, Regulation (EC) No 1267/2003, Eurostat ESA 1995 manual).

Financial costs, net

“Financial costs, net” includes the Income, coming from financial activity of the enterprise, minus the financial costs.

Extraordinary costs, net

“Extraordinary costs, net” is the difference between “Extraordinary income” and “Extraordinary charges”.

“Extraordinary income” and “Extraordinary charges” are the income and costs that arise otherwise than in the course of the company's ordinary activities (Article 29 of the Fourth Council Directive 78/660/EEC of 25 July 1978).

Total value of assets

This parameter corresponds to the Balance sheet total of the Structural Business Statistics and the Capital value in the European System of Accounts.

Balance sheet total consists of the sum of items 1 to 16 of the asset side of the balance sheet or of the sum of items 1 to 14 of the liability side of the balance sheet. (Structural Business Statistics (SBS) Code 43 30 0, Commission Regulation (EC) No 2700/98).

Capital value is the total accumulated value of all net investments in the enterprise at the end of the year. ESA 7.09 to 7.24 European System of Accounts 1995 (Regulation (EC) No 2223/96, Regulation (EC) No 1267/2003, Eurostat ESA 1995 manual).

Net Investments

"Net investments" refers to the difference between Purchase (Gross investment in tangible goods) and Sale (Sales of tangible investment goods) of assets during the year.

Gross investment in tangible goods is the Investment during the reference period in all tangible goods. Included are new and existing tangible capital goods, whether bought from third parties or produced for own use (i.e. Capitalised production of tangible capital goods), having a useful life of more than one year including non-produced tangible goods such as land. The threshold for the useful life of a good that can be capitalised may be increased according to company accounting practices where these practices require a greater expected useful life than the one year threshold indicated above.

All investments are valued prior to (i.e. gross of) value adjustments, and before the deduction of income from disposals. Purchased goods are valued at purchase price, i.e. transport and installation charges, fees, taxes and other costs of ownership transfer are included.

Own produced tangible goods are valued at production cost. Goods acquired through restructurations (such as mergers, take-overs, break-ups, split-off) are excluded. Purchases of small tools which are not capitalised are included under current expenditure. Also included are all additions, alterations, improvements and renovations which prolong the service life or increase the productive capacity of capital goods. Current maintenance costs are excluded as is the value and current expenditure on capital goods used under rental and lease contracts. Investment in intangible and financial assets are excluded. Concerning the recording of investments where the invoicing, delivery, payment and first use of the good may take place in different reference periods, the following method is proposed as an objective:

i) Investments are recorded when the ownership is transferred to the unit that intends to use them. Capitalised production is recorded when produced. Concerning the recording of investments made in identifiable stages, each part-investment should be recorded in the reference period in which they are made.

In practice this may not be possible and company accounting conventions may mean that the following approximations to this method need to be used:

i) investments are recorded in the reference period in which they are delivered,
ii) investments are recorded in the reference period in which they enter into the production process,
iii) investments are recorded in the reference period in which they are invoiced,
iv) investments are recorded in the reference period in which they are paid for.

Gross investment in tangible goods is based on Gross investment in land (15 12 0) + Gross investment in existing buildings and structures (15 13 0) + Gross investment in construction and alteration of buildings (15 14 0) + Gross investment in machinery and equipment (15 15 0). (Structural Business Statistics (SBS) Code 15 11 0, Commission Regulation (EC) No 2700/98).

Sales of tangible goods includes the value of existing tangible capital goods, sold to third parties. Sales of tangible capital goods are valued at the price actually received (excluding VAT), and not at book value, after deducting any costs of ownership transfer incurred by the seller. Value adjustments and disposals other than by sale are excluded. (Structural Business Statistics (SBS) Code 15 21 0. Commission Regulation (EC) No 2700/98).

Debt

Financial assets created when creditors lend funds to debtors, either directly or through brokers, which are either evidenced by non-negotiable documents or not evidenced by documents.

Short-term loans - loans whose original maturity is normally one year or less, and in exceptional cases two years at the maximum, and loans repayable on demand.

Long-term loans - loans whose original maturity is normally more than one year, and in exceptional cases more than two years at the minimum.

“Debts” account for provisions and long- and short-term debt (STECF meeting SGECA 06-01).

Livestock (volume)

Volume of livestock purchased during the reference period. The variable for livestock volume should correspond to the variable for livestock cost.

Fish feed (volume)

Volume of feed purchased during the reference period. The variable for feed volume should

correspond to the variable for feed cost.

Volume of sales

The variable for production volume should correspond to the variable on turnover value. Conversion factors from numbers to tonnes should be stated in the national programme.

Number of persons employed (Total employment)

This indicator refers to the number of people employed (including full-time and part-time employees) (SGECA-09-03). It corresponds to the Number of people employed of the Structural Business Statistics.

The number of persons employed is defined as the total number of persons who work in the observation unit (inclusive of working proprietors, partners working regularly in the unit and unpaid family workers), as well as persons who work outside the unit who belong to it and are paid by it (e.g. sales representatives, delivery personnel, repair and maintenance teams). It includes persons absent for a short period (e.g. sick leave, paid leave or special leave), and also persons on strike, but not those absent for an indefinite period. It also includes part-time workers who are regarded as such under the laws of the country concerned and who are on the pay-roll, as well as seasonal workers, apprentices and home workers on the pay-roll. The number of persons employed excludes manpower supplied to the unit by other enterprises, persons carrying out repair and maintenance work in the enquiry unit on behalf of other enterprises, as well as those on compulsory military service. Unpaid family workers refer to persons who live with the proprietor of the unit and work regularly for the unit, but do not have a contract of service and do not receive a fixed sum for the work they perform. This is limited to those persons who are not included on the payroll of another unit as their principal occupation. (Structural Business Statistics (SBS) Code 16 11 0, Commission Regulation (EC) No 2700/98).

The number of employees should be reported by gender.

FTE National

"FTE national" refers to the number of full time equivalents (methodologies to calculate one FTE varies between the countries) (SGECA-09-03).

It corresponds to the "Number of employees in full time equivalent units" of the Structural Business Statistics.

The number of employees converted into full time equivalents (FTE). Figures for the number of persons working less than the standard working time of a full-year full-time worker, should be converted into full time equivalents, with regard to the working time of a full-time full-year employee in the unit. Included in this category are people working less than a standard working day, less than the standard number of working days in the week, or less than the standard number of weeks/months in the year. The conversion should be carried out on the basis of the number of hours, days, weeks or months worked. (Structural Business Statistics (SBS) Code 16 14 0, Commission Regulation (EC) No 2700/98).

Reporting the number of FTE national by gender is optional.

Number of enterprises:

The "Number of enterprises" parameter corresponds to a count of the number of enterprises active during at least a part of the reference period (SGECA-09-03).

A count of the number of enterprises registered to the population concerned in the business register corrected for errors, in particular frame errors. Dormant units are excluded. This statistic should include all units active during at least part of the reference period. (Structural Business Statistics (SBS) Code 11 11 0, Commission Regulation (EC) No 2700/98).

Both definitions are similar. However, there are often some divergences with Eurostat data. This is mostly due to the use of the Veterinary list (which is necessary to trade with food products) to update the business register and so companies that are dormant or focusing on other products have been excluded.

Moreover, under the DCF regulation, the number of companies should be disaggregated by the number of persons employed (in ≤5; 6-10 and >10 FTE) (Structural Business Statistics (SBS) Code 16 14 0, Commission Regulation (EC) No 2700/98).

Indicators calculated

Mean wage or Average salary

The average salary or mean wage estimates the salary an employee working full time is receiving on this sector. It includes the salaries themselves and the social security costs.

(Wages and salaries + Inputed value of unpaid labour) / FTE

Gross Value Added (GVA)

Gross Value Added measures the contribution of the sector to the economy.

The Gross Value Added indicator calculated in this report is similar, but does not fully correspond to the Value added at factor cost of the Structural Business Statistics.

Value added at factor cost as defined in the Structural Business Statistics is the gross income from operating activities after adjusting for operating subsidies and indirect taxes. It can be calculated from turnover, plus capitalised production, plus other operating income, plus or minus the changes in stocks, minus the purchases of goods and services, minus other taxes on products which are linked to turnover but not deductible, minus the duties and taxes linked to production. Alternatively it can be calculated from gross operating surplus by adding personnel costs. Income and expenditure classified as financial or extra-ordinary in company accounts is excluded from value added. Value added at factor costs is calculated "gross" as value adjustments (such as depreciation) are not subtracted. (Structural Business Statistics (SBS) Code 12 15 0, Commission Regulation (EC) No 2700/98).

Thus, Gross Value Added is calculated on this report as:

GVA = Turnover + Other Income – Energy costs – Livestock costs – Feed costs - Repair and maintenance - Other Operational costs.

Earnings Before Interest and Tax (EBIT)

“Earnings before interest and taxes (EBIT)” or “Operating profit” is a measure of a firm's profitability that excludes interest and income tax expenses.

EBIT = Turnover + Other Income + Subsidies – Energy costs – Wages and salaries - Imputed value of unpaid labour - Livestock costs – Feed costs – Repair and maintenance – Other Operational costs – Depreciation of capital.

Return on Investment (ROI)

Return on investment is a performance measure to evaluate the profitability (efficiency) of an investment.

During the SGECA-10-04 meeting it was decided that it was more appropriate to calculate the Return on Investment using the "Earnings Before Interest and Tax (EBIT)", rather than the Net profit.

ROI = EBIT / Total Value of Assets

Running Cost to Turnover Ratio in %

This indicator shows how much of the turnover (income) is consumed by production costs.

Running cost to tunover ratio = (Energy costs + Wages and salaries + Livestock costs + Feed costs + Repair and maintenance + Other Operational costs) x 100 / Turnover

Earnings Before Interest and Tax (EBIT) to turnover ratio

"Earnings before interest and taxes (EBIT) to turnover ratio" measures the margin of the companies.

EBIT to turnover ratio = (EBIT / Turnover) x 100

Labour productivity (by FTE or Employee):

Labour productivity is calculated as the average output per worker or per time unit. For the data collected under the DCF this can be calculated as *Gross Value Added (GVA)* divided by *Full Time Equivalents (FTE)*. This indicator describes the value added to the economy from the activity, in this case the value added to the economy by one FTE.

$$\text{Labour productivity} = \frac{GVA}{FTE}$$

When a MS cannot report the level of employment in FTEs, the number of employees is used as a second best alternative. However, this alternative compromises the comparison and should be clearly stated in the report.

Capital productivity:

Capital productivity is calculated as the average output per unit of capital. For the data collected under the DCF this can be calculated as *Gross Value Added (GVA)* divided by *Capital value (total value of assets)*. The indicator describes the value added to the economy by one unit of capital.

$$\text{Capital productivity} = \frac{GVA}{Capital\_value}$$

Future Expectations of the Industry indicator:

The indicator "Future Expectations of the Industry", developed in the EWG 11-03 from an initial idea of Michael Ebeling, could be interpreted as a proxy for the industry's wish to remain in the market in the medium/long term. If investment minus depreciation is positive, it has the meaning that the sector is allocating resources to increase its production capacity, and therefore it expects to remain in the market to recover the cost of the investment. If investment minus depreciation is close to zero, it could be interpreted as an indicator that the sector is only wishing to maintain its production capacity in the future, and that it is not planning to expand. The third case is where the sector is not even covering its depreciation costs, thus disinvesting with the possible intention to reduce its presence in the market in the future. Therefore, this indicator would be used to approximate the industry's investing behaviour in the future and it has been considered useful by the experts.

$$\mathrm{FEI} = \frac{(Net\_investments - Depreciation)}{Capital\_value}$$

9. REFERENCES

Asche, F. 2008. Farming the Sea. Marine Resource Economics, 23:527-547.

Buck, Ebeling, & Michler-Cieluch. 2010. Mussel cultivation as a co-use in offshore wind farms: potential and economic feasibility, Aquaculture Economics & Management, 14:4, 255-281.

Burridge, L., Weis, J.S., Cabello, F., Pizarro, J. & Bostick, K. 2010. Chemical use in salmon aquaculture: A review of current practices and possible environmental effects. Aquaculture, 306, 7-23.

COGEA. 2010. European market observatory for fisheries and aquaculture products, Results of phase 1, executive summary draft.

Delgado, C.L., Wada, N., Rosengrant, M.W., Meijer, S., & Ahmed, M. 2003. Fish to 2020: Supply and Demand in Changing Global Markets. Washington, DC: IFPRI.

Directorate of Fisheries. 2010. Vision no escapees – Action plan from the Directorate of Fisheries. Available at http://www.fiskeridir.no/english/aquaculture/vision-no-escapees.

DG MARE. 2010. New organic aquaculture rules a route to a more sustainable and profitable future for aquaculture. Press release - 30/06/2010. Available at: http://ec.europa.eu/fisheries/news_and_events/press_releases/300610/index_en.htm

Eicaite, O. & Juskeviciene, D. 2010. Akvakultūros ūkių ekonominio dydžio, išreikšto Europinio dydžio vienetais, nustatymas, Management theory and studies for rural business and infrastructure development. Nr. 22(3).

Ernst & Young. 2008. Image survey on the perception of fishery and aquaculture products, Study 1 in the course of the framework contract Lot 3 – studies concerning the implementation of the European Fisheries Fund

Ernst & Young. 2009. Study on the supply and marketing of fishery and aquaculture products in the European Union

European Commission. 2002. Communication from the Commission on a Strategy for the Sustainable Development of European Aquaculture – EUR. COM(2002) 511.

European Commission. 2009. Communication from the Commission to the European Parliament and Council. Building a sustainable future for aquaculture. A new impetus for the Strategy for the Sustainable Development of European Aquaculture. COM(2009) 162 final.

European Parliament. 2009. Regulatory and legal constraints for European aquaculture. Study. Directorate-General for Internal Policies. PE 431.568. ISBN 978-92-823-3081-4.

EUROSTAT. 2011a. Aquaculture production, Total. Consultation on November 2011. Electronic address: http://epp.eurostat.ec.europa.eu/portal/fisheries/data/main_tables

EUROSTAT. 2011b. Exchange rates. Consultation on November 2011. Electronic address: http://epp.eurostat.ec.europa.eu/portal/page/portal/exchange_rates/data/main_tables

FAO. 2010a. Synthesis of the Mediterranean marine finfish aquaculture - a marketing and promotion strategy, General Fisheries Commission for the Mediterranean, Studies and Reviews No. 88

FAO. 2010b. The state of world fisheries and aquaculture, FAO Fisheries and Aquaculture Department, Rome

FAO. 2011a. Global Aquaculture Production 1950-2009 database (Release date: March 2011). Electronic address: http://www.fao.org/fishery/statistics/global-aquaculture-production/query/en

FAO. 2011b. Global Capture Production 1950-2009 database (Release date: February 2011). Electronic address: http://www.fao.org/fishery/statistics/global-capture-production/query/en

FRAMIAN, 2009. Review of the EU aquaculture sector and results of costs and earnings survey, part 1 of the final report on definition of data collection needs for aquaculture, Ref. No, FISH/2006/15-Lot 6.

France Agrimer. 2010. Production des produits de la pêche et de l'aquaculture: Bilan Annuel 2008. Collection Données statistiques. Electronic version available at: http://www.franceagrimer.fr/content/download/3235/17763/file/2008_bilan%20production.pdf.

Glover, K.A., Skilbrei, O.T. & Skaala, Ø. 2008. Genetic assignment identifies farm of origin for Atlantic salmon Salmo salar escapees in a Norwegian fjord. ICES Journal of Marine Science, 65, 912.

Government Office for Science. 2011. Foresight. The Future of Food and Farming: Challenges and choices for global sustainability - Final report. London, The Government Office for Science.

Government Offices of Sweden. 2009. Det växande vattenbrukslandet. SOU 2009:26. (In Swedish).

Government Offices of Sweden. National Strategic Plan for the Fisheries Sector 2007-2013., pp. 4.

JRC. 2008a. Prospective analysis of the aquaculture sector in the EU, Part 1: Synthesis report, EUR 23409 EN/12 -2008

JRC. 2008b. Prospective analysis of the aquaculture sector in the EU, Part 2: Characterisation of emerging aquaculture systems, EUR 23409 EN/2 -2008

National Bank of Greece. 2010. Sectoral Report: Aquaculture (in Greek). Available at http://tinyurl.com/3entlch

Naylor, R., Hindar, K., Fleming, I.A., Goldburg, R., Williams, S., Volpe, J., Whoriskey, F., Eagle, J., Kelso, D. & Mangel, M. 2005. Fugitive salmon: Assessing the risks of escaped fish from net-pen aquaculture. BioScience, 55, 427-437.

Nielsen, R. 2011. Green and Technical Efficient Growth in Danish Fresh Water Aquaculture. Aquaculture Economics & Management.

Nielsen, R. 2011. Introducing Individual Transferable Quotas on Nitrogen in Danish Fresh Water Aquaculture: Production and Profitability Gains.

Stenton-Dozey, JME., Jackson, LF., & Busby, AJ. 1999. Impact of mussel culture on macrobenthic community structure in Saldanha Bay, South Africa. Marine Pollution Bulletin, 39 (1-2):357-366.

Svaasand, T., Crosetti, D., Garcia-Vazquez E. & Verspoor, E. (Eds.). 2007. Genetic impact of aquaculture activities on native populations (Genimpact), Brussels.

The Swedish Board of Agriculture. 2010. Matlandet ur ett regionalt perspektiv. 2010:13. (In Swedish).

Utter, F. & Epifanio, J. 2002. Marine aquaculture: Genetic potentialities and pitfalls. Reviews in Fish Biology and Fisheries, 12, 59-77.

Vaikutis, V. 2010. Inland fishery, Agriculture and food sector in Lithuania 2010, LIAE, Vilnius. (in Lithuanian)

10. APPENDICES

10.1. Segment codes

Code	Main species	Technology
seg1.1	Salmon	Hatcheries & nurseries
seg1.2	Salmon	On growing
seg1.3	Salmon	Combined
seg1.4	Salmon	Cages
seg2.1	Trout	Hatcheries & nurseries
seg2.2	Trout	On growing
seg2.3	Trout	Combined
seg2.4	Trout	Cages
seg3.1	Sea bass & Sea bream	Hatcheries & nurseries
seg3.2	Sea bass & Sea bream	On growing
seg3.3	Sea bass & Sea bream	Combined
seg3.4	Sea bass & Sea bream	Cages
seg4.1	Carp	Hatcheries & nurseries
seg4.2	Carp	On growing
seg4.3	Carp	Combined
seg4.4	Carp	Cages
seg5.1	Other freshwater fish	Hatcheries & nurseries
seg5.2	Other freshwater fish	On growing
seg5.3	Other freshwater fish	Combined
seg5.4	Other freshwater fish	Cages
seg6.1	Other marine fish	Hatcheries & nurseries
seg6.2	Other marine fish	On growing
seg6.3	Other marine fish	Combined
seg6.4	Other marine fish	Cages
seg7.1	Mussel	Rafts
seg7.2	Mussel	Long line
seg7.3	Mussel	Bottom
seg7.4	Mussel	Other
seg8.1	Oyster	Rafts
seg8.2	Oyster	Long line
seg8.3	Oyster	Bottom
seg8.4	Oyster	Other
seg9.1	Clam	Rafts
seg9.2	Clam	Long line
seg9.3	Clam	Bottom
seg9.4	Clam	Other
seg10.1	Other shellfish	Rafts
seg10.2	Other shellfish	Long line
seg10.3	Other shellfish	Bottom
seg10.4	Other shellfish	Other

10.2. Data Appendices

Belgium

No data

Bulgaria

Year: 2008

Variable	unit	total	Seg. 2.3	Seg. 2. 4	Seg. 4. 3	Seg. 4. 4	Seg. 5. 3	Seg. 5. 4	Seg. 7. 2
Turnover	000 EURO	7211.42	1865.60	2694.40	1173.60	549.60	640.50	325.50	121.60
Subsidies	000 EURO	0							
Other income	EURO	0							
Total income	EURO	7435582.53							
Wages and salaries	EURO	1828193.18							
Imputed value of unpaid labour	EURO	148825.95							
Energy costs	EURO	356292.05							
Raw material costs: Feed costs	EURO	2997301.28							
Raw material costs: Livestock costs	EURO	16537847.21	4436646	4579200	3938400	996000	1898000	429000	238000
Repair and maintenance	EURO	362814.92							
Other operational costs	EURO	1032753.96							
Depreciation of capital	EURO	623354.18							
Financial costs, net	EURO	1617802.63							
Extraordinary costs, net	EURO	174378.65							
Total value of assets	EURO	38249840.14							
Net Investments	EURO	5313090.46							
Debt	EURO	28157993.87							
Raw material volume: Feed	TONNE	7202.73							
Raw material volume: Livestock	TONNE	7251	1374	1431	1641	415	1460	330	595
Total sales volume	TONNE	2855.10	583	842	489	229	305	155	304
Male employees	NUMBER	801							
Female employees	NUMBER	309							
Total employees	NUMBER	1100							
Male FTE	NUMBER	801							
Female FTE	NUMBER	309							
FTE	NUMBER	1100							
Number of enterprises <=5 employees	NUMBER	241							
Number of enterprises 6-10 employees	NUMBER	25							
Number of enterprises >10 employees	NUMBER	8							
Number of enterprises	NUMBER	274							
Employment per firm	EURO	4.01							
FTE per firm	EURO	4.01							
Mean wage	EURO	1797.29							
Total production costs	EURO	23264028.55							
Gross Added Value	000 EURO	-13851.43							
Operating Cash Flow	EURO	-15828446.02							
EBIT	000 EURO	-16451.80							
Net Profit	EURO	-18069602.83							
Return on investment	%	-43.01							
Running cost to turnover ratio	%	322.60							
EBIT to turnover ratio	%	-228.14							
Labour productivity	000 €/FTE	-12.59							
Capital productivity	%	-36.21							
Financial Position	%	26.38							
Future expectations of the industry	%	-0.12							

Year: 2009

Variable	unit	total	Seg. 2.3	Seg. 2. 4	Seg. 4. 3	Seg. 4. 4	Seg. 5. 3	Seg. 5. 4	Seg. 7. 2
Turnover	000 EURO	8430.77	2280.58	3667.91	1314.65	512.19	601.85	198.04	252.55
Subsidies	000 EURO	0							
Other income	EURO	0							
Total income	EURO	8430774.72	2280584	3667912	1314651	512193	601848	198044	252546
Wages and salaries	EURO	2455572.80							
Imputed value of unpaid labour	EURO	500326.05							
Energy costs	EURO	419981.29							
Raw material costs: Feed costs	EURO	3505976.28							
Raw material costs: Livestock costs	EURO	19531187.77							
Repair and maintenance	EURO	435310.90							
Other operational costs	EURO	991879.66							
Depreciation of capital	EURO	712993.26							
Financial costs, net	EURO	1524383.32							
Extraordinary costs, net	EURO	223905.99							
Total value of assets	EURO	25959152.17							
Net Investments	EURO	1540536.50							
Debt	EURO	35917346.40							
Raw material volume: Feed	TONNE	9331.94							
Raw material volume: Livestock	TONNE	7912	961	1765	1875	613	1366	519	812
Total sales volume	TONNE	3266	697	1121	507	201	468	154	294
Male employees	NUMBER	930							
Female employees	NUMBER	445							
Total employees	NUMBER	1375							
Male FTE	NUMBER	930							
Female FTE	NUMBER	445							
FTE	NUMBER	1375							
Number of enterprises <=5 employees	NUMBER	316							
Number of enterprises 6-10 employees	NUMBER	13							
Number of enterprises >10 employees	NUMBER	7							
Number of enterprises	NUMBER	336							
Employment per firm	EURO	4.09							
FTE per firm	EURO	4.09							
Mean wage	EURO	2149.74							
Total production costs	EURO	27840234.75							
Gross Added Value	000 EURO	-16453.56							
Operating Cash Flow	EURO	-19409460.03							
EBIT	000 EURO	-20122.45							
Net Profit	EURO	-21646836.61							
Return on investment	%	-77.52							
Running cost to turnover ratio	%	330.22							
EBIT to turnover ratio	%	-238.68							
Labour productivity	000 €/FTE	-11.97							
Capital productivity	%	-63.38							
Financial Position	%	-38.36							
Future expectations of the industry	%	-0.03							

Year: 2008

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)
Bighead carp	243311.02	225.00
Bleak	784.58	0.50
Brook trout	8702.19	2.50
Chub	1008.78	1.00
Common carp	1722879.80	710.00
Danube sturgeon(=Osetr)	283626.70	57.20
European perch	487.01	0.50
Goldfish	11492.51	18.70
Grass carp(=White amur)	117893.68	45.00
Mediterranean mussel	135692.77	304.00
Northern pike	41583.37	15.00
Pike-perch	5972.91	2.20
Rainbow trout	4477191.27	1425.00
Rudd	493.40	1.00
Sea trout	19378.98	6.00
Silver carp	3965.58	4.00
Wels(=Som)catfish	136113.57	37.00
Cambaridae Euro-American crayfishes nei	836.98	0.50

Year: 2009

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)
Barramundi(=Giant seaperch)	4047.25	0.99
Bighead carp	335068.49	332.32
Black carp	198.89	0.39
Bleak	2543.60	1.62
Brook trout	4298.75	1.31
Channel catfish	78843.85	34.88
Chub	85.46	0.09
Common carp	1951408.77	752.67
Danube sturgeon(=Osetr)	190204.28	36.23
European perch	291.95	0.40
Freshwater bream	596.00	1.20
Goldfish	33936.66	62.22
Grass carp(=White amur)	102233.00	57.46
Mediterranean mussel	252874.36	294.45
Northern pike	151191.58	54.54
Pike-perch	19238.37	7.27
Rainbow trout	4996681.41	1527.34
Rudd	451.47	1.77
Sea trout	46056.19	14.08
Silver carp	22513.20	22.02
Sterlet sturgeon	2147.51	0.29
Tench	153.39	0.05
Wels(=Som)catfish	234733.27	62.35
Cambaridae Euro-American crayfishes nei	728.08	0.37

Cyprus

Variable	unit	2008	2009
Turnover	000 EURO	32098.66	19831.03
Subsidies	000 EURO	826.31	607.23
Other income	EURO	427334	515388
Total income	EURO	33352297	20953649
Wages and salaries	EURO	2630876	2857792
Imputed value of unpaid labour	EURO	0	0
Energy costs	EURO	286854	432293
Raw material costs: Feed costs	EURO	9639952	7397965
Raw material costs: Livestock costs	EURO	6380900	3508348
Repair and maintenance	EURO	305552.00	429.99
Other operational costs	EURO	1295003	1562005
Depreciation of capital	EURO	609347	10207
Financial costs, net	EURO	235774	275243
Extraordinary costs, net	EURO	1374650	1382130
Total value of assets	EURO	15632931	35478369
Net Investments	EURO	2801778	2554708
Debt	EURO	3069739	2568603
Raw material volume: Feed	TONNE	9645586	12563618
Raw material volume: Livestock	TONNE	7923168	13714000
Total sales volume	TONNE	6920877	4082773
Male employees	NUMBER	117	108
Female employees	NUMBER	20	25
Total employees	NUMBER	137	133
Male FTE	NUMBER	156.10	164.69
Female FTE	NUMBER	74.90	78.15
FTE	NUMBER	228.00	242.84
Number of enterprises <=5 employees	NUMBER	2	4
Number of enterprises 6-10 employees	NUMBER	2	1
Number of enterprises >10 employees	NUMBER	5	7
Number of enterprises	NUMBER	9	12
Employment per firm	EURO	15.22	11.08
FTE per firm	EURO	25.33	20.24
Mean wage	EURO	11538.93	11768.21
Total production costs	EURO	20539137.00	15758832.99
Gross Added Value	000 EURO	14617.73	7445.38
Operating Cash Flow	EURO	12813160.00	5194816.01
EBIT	000 EURO	12203.81	5184.61
Net Profit	EURO	11968039.00	4909366.01
Return on investment	%	78.06	14.61
Running cost to turnover ratio	%	63.99	79.47
EBIT to turnover ratio	%	38.02	26.14
Labour productivity	000 €/FTE	64.11	30.66
Capital productivity	%	93.51	20.99
Financial Position	%	80.36	92.76
Future expectations of the industry	%	-0.14	-0.07

Year: 2008

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 3.1 value	Seg. 3.1 weight	Seg. 3.4 value	Seg. 3.4 weight	Seg. 5.1 value	Seg. 5.1 weight	Seg. 6.2 value	Seg. 6.2 weight	Seg. 6.4 value	Seg. 6.4 weight
Cyprinus sp.	32241	57.677							32241	57.677				
Penaeus Indicus	67000	446.76									67000	446.76		
Sea Bass & Sea Bream	2884800	14874.81					2884800	14874.806						
Sea Bass & Sea Bream (Hatcheries)	1615240	11768.55			1615240	11768.55								
Siganus Rivulatus	77249	20.44											9199	88.49
Thunnus Thynnus	8300132	1019.58											8300132	1019.58
Trout	54836	423.80	54836	423.804										

Year: 2009

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 3.1 value	Seg. 3.1 weight	Seg. 3.4 value	Seg. 3.4 weight	Seg. 5.1 value	Seg. 5.1 weight	Seg. 6.1 value	Seg. 6.1 weight	Seg. 6.2 value	Seg. 6.2 weight
Argyrosomus regius (Hatcheries)	44650	50									44650	50		
Cyprinus sp.	71274	52.90							71274	52.902				
Pagrus pagrus	71120	10.16											71120	10.16
Penaeus Indicus	107800	56.68											107800	56.68
Puntazo Puntazzo (Hatcheries)	41880	420									41880	420		
Sea Bass & Sea Bream	16820369	3389.09					16820369	3389.088						
Sea Bass & Sea Bream (Hatcheries)	2117605	12749.39			2117605	12479.39								
Siganus Rivulatus	25670	3.03											25670	3.031
Trout	428925	67.88	428925	67.884										

Denmark

Year: 2008

Variable	unit	total	Seg. 2.3	Seg. 2.4	Seg. 5.3	Seg. 7.2
Turnover	000 EURO	130028.43	76721.16	36191.93	12859.31	1309.55
Subsidies	000 EURO	0	0	0	0	0
Other income	EURO	4764351	4320547	184415	67999	135730
Total income	EURO	134792784	81041711	36376341	12927307	1445279
Wages and salaries	EURO	18398069	12714324	2877817	1813439	624464
Imputed value of unpaid labour	EURO	3498122	3498122	0	0	0
Energy costs	EURO	6398337	4595896	183342	1321620	0
Raw material costs: Feed costs	EURO	45690317	29671137	11614807	3088653	0
Raw material costs: Livestock costs	EURO	24128487	11405311	9151288	3352870	0
Repair and maintenance	EURO	12269447	7983101	2576985	984442	496915
Other operational costs	EURO	15731089	5531921	8567597	1160676	199973
Depreciation of capital	EURO	6490209	4370440	1222237	499329	224920
Financial costs, net	EURO	7032994	4880901	1456813	457350	86776
Extraordinary costs, net	EURO	0	0	0	0	0
Total value of assets	EURO	193829131	125596164	41360247	20867892	2447023
Net Investments	EURO	13133450	10661883	1095762	147666	923552
Debt	EURO	152596164	102497854	33381035	11724651	2311293
Raw material volume: Feed	TONNE	42761	29269	9592	2534	0
Raw material volume: Livestock	TONNE	7348	4430	2872	20	0
Total sales volume	TONNE	45324	32605	8911	1606	1481
Male employees	NUMBER	476	336	81	35	16
Female employees	NUMBER	63	41	13	4	3
Total employees	NUMBER	539	378	94	39	18
Male FTE	NUMBER	322	228	55	24	11
Female FTE	NUMBER	43	28	9	3	1
FTE	NUMBER	365	256	64	26	12
Number of enterprises <=5 employees	NUMBER	162	134	6	8	10
Number of enterprises 6-10 employees	NUMBER					
Number of enterprises >10 employees	NUMBER					
Number of enterprises	NUMBER	162	134	6	8	10
Employment per firm	EURO	3.33	2.82	15.67	4.88	1.80
FTE per firm	EURO	2.25	1.91	10.67	3.25	1.20
Mean wage	EURO	59989.56	63329.87	44965.89	69747.65	52038.67
Total production costs	EURO	126113868	75399812	34971836	11721700	1321352
Gross Added Value	000 EURO	30575.11	21854.35	4282.32	3019.05	
Operating Cash Flow	EURO	8678916	5641899	1404505	1205607	
EBIT	000 EURO	2188.71	1271.46	182.27	706.28	
Net Profit	EURO	-4844287	-3609442	-1274545	248928	
Return on investment	%	1.13	1.01	0.44	3.38	
Running cost to turnover ratio	%	96.99	98.28	96.63	91.15	100.90
EBIT to turnover ratio	%	1.68	1.66	0.50	5.49	
Labour productivity	000 €/FTE	83.77	85.37	66.91	116.12	
Capital productivity	%	15.77	17.40	10.35	14.47	
Financial Position	%	21.27	18.39	19.29	43.81	5.55
Future expectations of the industry	%	-0.03	-0.05	0.00	0.02	-0.29

Year: 2009

Variable	unit	total	Seg. 2.3	Seg. 2.4	Seg. 5.3	Seg. 7.2
Turnover	000 EURO	134970.72	79189.52	41252.72	11324.30	1681.66
Subsidies	000 EURO	0	0	0	0	0
Other income	EURO	5178077	3435444	1437512	190433	77355
Total income	EURO	140148801	82624963	42690231	11514732	1759018
Wages and salaries	EURO	17795386	11976847	2988907	1693347	745078
Imputed value of unpaid labour	EURO	3517976	3517976	0	0	0
Energy costs	EURO	6762107	5103677	139803	1323897	0
Raw material costs: Feed costs	EURO	43340362	29250356	10939271	2599581	0
Raw material costs: Livestock costs	EURO	34943998	15165991	16627542	2739250	155381
Repair and maintenance	EURO	11779297	7320378	2484489	1033010	749107
Other operational costs	EURO	15316537	5098439	8738148	1060004	262281
Depreciation of capital	EURO	7899197	5545110	1123795	568209	376837
Financial costs, net	EURO	6059064	4781231	403427	383417	267922
Extraordinary costs, net	EURO	0	0	0	0	0
Total value of assets	EURO	188086944	126971610	34653783	19306358	3822352
Net Investments	EURO	7938009	6035427	673364	246972	918186
Debt	EURO	151053826	106123258	27375440	9778142	4251565
Raw material volume: Feed	TONNE	38521	26800	9195	2143	0
Raw material volume: Livestock	TONNE	11223	5421	5747	14	0
Total sales volume	TONNE	45877	31191	10282	1376	2534
Male employees	NUMBER	470	316	81	39	24
Female employees	NUMBER	62	39	13	5	5
Total employees	NUMBER	532	355	94	44	29
Male FTE	NUMBER	318	214	55	27	16
Female FTE	NUMBER	42	26	9	3	2
FTE	NUMBER	360	240	64	30	18
Number of enterprises <=5 employees	NUMBER	160	126	6	9	15
Number of enterprises 6-10 employees	NUMBER					
Number of enterprises >10 employees	NUMBER					
Number of enterprises	NUMBER	160	126	6	9	15
Employment per firm	EURO	3.33	2.82	15.67	4.89	1.93
FTE per firm	EURO	2.25	1.90	10.67	3.33	1.20
Mean wage	EURO	59203.78	64561.76	46701.67	56444.90	41393.22
Total production costs	EURO	133455663	77433664	41918160	10449089	1911847
Gross Added Value	000 EURO	28006.50	20686.12	3760.98	2758.99	
Operating Cash Flow	EURO	6693138	5191299	772071	1065643	
EBIT	000 EURO	-1206.06	-353.81	-351.72	497.43	
Net Profit	EURO	-7265123	-5135042	-755151	114017	
Return on investment	%	-0.64	-0.28	-1.01	2.58	
Running cost to turnover ratio	%	98.88	97.78	101.61	92.27	113.69
EBIT to turnover ratio	%	-0.89	-0.45	-0.85	4.39	
Labour productivity	000 €/FTE	77.80	86.19	58.77	91.97	
Capital productivity	%	14.89	16.29	10.85	14.29	
Financial Position	%	19.69	16.42	21.00	49.35	-11.23
Future expectations of the industry	%	0.00	0.00	0.01	0.02	-0.14

Year: 2008

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.3 value	Seg. 2.3 weight	Seg. 2.4 value	Seg. 2.4 weight	Seg. 5.3 value	Seg. 5.3 weight	Seg. 7.2 value	Seg. 7.2 weight
Eel	12859308	1606					12859308	1606		
Mussel	1309549	1481							1309549	1481
Trout	112913090	41516	76721164	32605	36191926	8911				

Year: 2009

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.3 value	Seg. 2.3 weight	Seg. 2.4 value	Seg. 2.4 weight	Seg. 5.3 value	Seg. 5.3 weight	Seg. 7.2 value	Seg. 7.2 weight
Eel	11324300	1376					11324300	1376		
Mussel	1681663	2534							1681663	2534
Trout	120442239	41473	79189519	31191	41252720	10282				

Estonia

Year: 2008

Variable	unit	total	Seg. 2.2	Seg. 2.3
Turnover	000 EURO	825.94	348.15	477.79
Subsidies	000 EURO	55.79	55.79	0
Other income	EURO	526101	462189	63912
Total income	EURO	1407825	866126	541699
Wages and salaries	EURO	329734	232464	97270
Imputed value of unpaid labour	EURO	0	0	0
Energy costs	EURO	79150	47212	31938
Raw material costs: Feed costs	EURO	540411	169206	371205
Raw material costs: Livestock costs	EURO	99078	82376	16702
Repair and maintenance	EURO	45900	31529	14371
Other operational costs	EURO	129595	116217	13378
Depreciation of capital	EURO	109838	74457	35381
Financial costs, net	EURO	60159	54182	5977
Extraordinary costs, net	EURO	0	0	0
Total value of assets	EURO	3927676	2175435	1752241
Net Investments	EURO	91709	76981	14728
Debt	EURO	1370156	1280596	89560
Raw material volume: Feed	TONNE	427	146	281
Raw material volume: Livestock	TONNE	144	118	27
Total sales volume	TONNE	334	113	221
Male employees	NUMBER	27	20	7
Female employees	NUMBER	11	8	3
Total employees	NUMBER	38	28	10
Male FTE	NUMBER	16	12	4
Female FTE	NUMBER	8	6	2
FTE	NUMBER	24	18	6
Number of enterprises <=5 employees	NUMBER	10	7	3
Number of enterprises 6-10 employees	NUMBER	1	1	0
Number of enterprises >10 employees	NUMBER	0	0	0
Number of enterprises	NUMBER	11	8	3
Employment per firm	EURO	3.45	3.50	3.33
FTE per firm	EURO	2.18	2.25	2
Mean wage	EURO	13738.92	12914.67	16211.67
Total production costs	EURO	1223868	679004	544864
Gross Added Value	000 EURO	457.90	363.80	94.11
Operating Cash Flow	EURO	183957	187122	-3165
EBIT	000 EURO	74.12	112.67	-38.55
Net Profit	EURO	13960	58483	-44523
Return on investment	%	1.89	5.18	-2.20
Running cost to turnover ratio	%	148.18	195.03	114.04
EBIT to turnover ratio	%	8.97	32.36	-8.07
Labour productivity	000 €/FTE	19.08	20.21	15.68
Capital productivity	%	11.66	16.72	5.37
Financial Position	%	65.12	41.13	94.89
Future expectations of the industry	%	0.00	0.00	0.01

Year: 2009

Variable	unit	total	Seg. 2.2	Seg. 2.3
Turnover	000 EURO	1048.4	475.65	572.75
Subsidies	000 EURO	123.03	119.85	3.18
Other income	EURO	296106	288418	7688
Total income	EURO	1467539	883921	583619
Wages and salaries	EURO	279601	216115	63486
Imputed value of unpaid labour	EURO	0	0	0
Energy costs	EURO	127367	74602	52765
Raw material costs: Feed costs	EURO	442995	194624	248371
Raw material costs: Livestock costs	EURO	95434	45278	50156
Repair and maintenance	EURO	79431	62093	17338
Other operational costs	EURO	177774	153868	23905
Depreciation of capital	EURO	115400	84541	30859
Financial costs, net	EURO	66924	57987	8936
Extraordinary costs, net	EURO	0	0	0
Total value of assets	EURO	4044078	2500457	1543621
Net Investments	EURO	395892	355620	40272
Debt	EURO	1726608	1596465	130143
Raw material volume: Feed	TONNE	372	162	210
Raw material volume: Livestock	TONNE	132	61	71
Total sales volume	TONNE	421	155	267
Male employees	NUMBER	23	17	6
Female employees	NUMBER	10	8	2
Total employees	NUMBER	33	25	8
Male FTE	NUMBER	14	11	3
Female FTE	NUMBER	6	4	2
FTE	NUMBER	20	15	5
Number of enterprises <=5 employees	NUMBER	10	7	3
Number of enterprises 6-10 employees	NUMBER	1	1	0
Number of enterprises >10 employees	NUMBER	0	0	0
Number of enterprises	NUMBER	11	8	3
Employment per firm	EURO	3.00	3.13	2.67
FTE per firm	EURO	1.82	1.88	1.67
Mean wage	EURO	13980.05	14407.67	12697.20
Total production costs	EURO	1202602	746580	456021
Gross Added Value	000 EURO	421.51	233.60	187.91
Operating Cash Flow	EURO	264937	137341	127598
EBIT	000 EURO	149.54	52.80	96.74
Net Profit	EURO	82613	-5187	87803
Return on investment	%	3.70	2.11	6.27
Running cost to turnover ratio	%	114.71	156.96	79.62
EBIT to turnover ratio	%	14.26	11.1	16.89
Labour productivity	000 €/FTE	21.08	15.57	37.58
Capital productivity	%	10.42	9.34	12.17
Financial Position	%	57.31	36.15	91.57
Future expectations of the industry	%	-0.07	-0.11	-0.01

Year 2008

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 2.3 value	Seg. 2.3 weight
Rainbow trout	825936	334	348149	113	477787	221

Year 2009

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 2.3 value	Seg. 2.3 weight
Rainbow trout	1048404	421	475650	155	572754	267

Finland

Year 2008

Variable	unit	total	Seg. 5.1	Seg. 5.2	Seg. 5.3	Seg. 5.4
Turnover	000 EURO	65783.81	6820.72	2994.14	21989.15	33979.79
Subsidies	000 EURO	0	0	0	0	0
Other income	EURO	1551899	165861	39537	600109	746391
Total income	EURO	67335704	6986580	3033677	22589264	34726183
Wages and salaries	EURO	11357533	1503564	728754	5271926	3853289
Imputed value of unpaid labour	EURO	1730531	122317	244475	458687	905053
Energy costs	EURO	1779870	161702	92455	542240	983473
Raw material costs: Feed costs	EURO	25750371	2339432	1337596	7844887	14228456
Raw material costs: Livestock costs	EURO	6557781	595777	340642	1997837	3623524
Repair and maintenance	EURO	2243589	203831	116543	683513	1239703
Other operational costs	EURO	10112077	918686	525269	3080659	5587463
Depreciation of capital	EURO	2806865	335833	284466	1039707	1146859
Financial costs, net	EURO	-414034	-11189	239181	-1079338	437312
Extraordinary costs, net	EURO	-472156	-1140	0	-466992	-4024
Total value of assets	EURO	84422790	8471706	7631343	33058750	35260991
Net Investments	EURO	1530187				
Debt	EURO	46123074	2572533	6110261	19560313	17879966
Raw material volume: Feed	TONNE	11125	1011	578	3389	6147
Raw material volume: Livestock	TONNE	4300	391	223	1310	2376
Total sales volume	TONNE	13585	1114	1693	91	10687
Male employees	NUMBER	336	49	30	146	112
Female employees	NUMBER	106	15	9	46	35
Total employees	NUMBER	442	64	39	192	147
Male FTE	NUMBER	274	38	22	119	95
Female FTE	NUMBER	87	12	7	38	30
FTE	NUMBER	361	50	29	157	125
Number of enterprises <=5 employees	NUMBER	252	22	20	170	40
Number of enterprises 6-10 employees	NUMBER	4	0	1	2	1
Number of enterprises >10 employees	NUMBER	6	1	0	4	1
Number of enterprises	NUMBER	262	23	21	176	42
Employment per firm	EURO	1.69	2.78	1.86	1.09	3.50
FTE per firm	EURO	1.38	2.17	1.38	0.89	2.98
Mean wage	EURO	36255.02	32517.62	33559.62	36500.72	38066.74
Total production costs	EURO	59531752	5845309	3385734	19879749	30420961
Gross Added Value	000 EURO	20892.02	2767.15	621.17	8440.13	9063.56
Operating Cash Flow	EURO	7803952	1141271	-352057	2709515	4305222
EBIT	000 EURO	4997.09	805.44	-636.52	1669.81	3158.36
Net Profit	EURO	5411121	816627	-875704	2749146	2721051
Return on investment	%	5.92	9.51	-8.34	5.05	8.96
Running cost to turnover ratio	%	90.50	85.70	113.08	90.41	89.53
EBIT to turnover ratio	%	7.60	11.81	-21.26	7.59	9.29
Labour productivity	000 €/FTE	57.87	55.34	21.42	53.76	72.51
Capital productivity	%	24.75	32.66	8.14	25.53	25.70
Financial Position	%	45.37	69.63	19.93	40.83	49.29
Future expectations of the industry	%	0.02	0.04	0.04	0.03	0.03

Year 2009

Variable	unit	total	Seg. 5.1	Seg. 5.2	Seg. 5.3	Seg. 5.4
Turnover	000 EURO	57383.24	6824.08	2220.87	39486.31	8851.98
Subsidies	000 EURO	0	0	0	0	0
Other income	EURO	1179240	166287	61750	892247	58956
Total income	EURO	58562475	6990367	2282616	40378560	8910932
Wages and salaries	EURO	12479259	1622475	453575	9382581	1020629
Imputed value of unpaid labour	EURO	1234646	131991	152161	710771	239723
Energy costs	EURO	1441994	174490	57544	949466	260495
Raw material costs: Feed costs	EURO	20862135	2524450	832516	13736448	3768721
Raw material costs: Livestock costs	EURO	5312906	642895	212015	3498226	959771
Repair and maintenance	EURO	1817685	219951	72536	1196835	328363
Other operational costs	EURO	8192484	991342	326926	5394253	1479963
Depreciation of capital	EURO	2684312	285287	280245	1619287	499493
Financial costs, net	EURO	1385987	-3701	206665	998029	184995
Extraordinary costs, net	EURO	-2364495	-8957	0	-2355502	-35
Total value of assets	EURO	81329743	8554833	6388673	54194312	12191925
Net Investments	EURO	2531114	170277	339692	1555709	465436
Debt	EURO	45355056	2597776	5115281	31459779	6182220
Raw material volume: Feed	TONNE	10542	1276	421	6941	1904
Raw material volume: Livestock	TONNE	3562	431	142	2345	643
Total sales volume	TONNE	13314	3027	1862	92	8333
Male employees	NUMBER	315	49	23	212	31
Female employees	NUMBER	103	16	7	70	10
Total employees	NUMBER	418	65	30	282	41
Male FTE	NUMBER	260	38	18	174	30
Female FTE	NUMBER	87	13	6	58	10
FTE	NUMBER	347	51	24	232	40
Number of enterprises <=5 employees	NUMBER	249	19	17	181	32
Number of enterprises 6-10 employees	NUMBER	4	0	1	3	0
Number of enterprises >10 employees	NUMBER	6	1	0	5	0
Number of enterprises	NUMBER	259	20	18	189	32
Employment per firm	EURO	1.61	3.25	1.67	1.49	1.28
FTE per firm	EURO	1.34	2.55	1.33	1.23	1.25
Mean wage	EURO	39521.34	34401.29	25239.00	43505.83	31508.80
Total production costs	EURO	51341109	6307594	2107273	34868580	8057665
Gross Added Value	000 EURO	20935.27	2437.24	781.08	15603.33	2113.62
Operating Cash Flow	EURO	7221366	682773	175343	5509980	853267
EBIT	000 EURO	4537.05	397.49	-104.90	3890.69	353.77
Net Profit	EURO	3151067	401187	-311567	2892664	168779
Return on investment	%	5.58	4.65	-1.64	7.18	2.90
Running cost to turnover ratio	%	89.47	92.43	94.89	88.31	91.03
EBIT to turnover ratio	%	7.91	5.82	-4.72	9.85	4.00
Labour productivity	000 €/FTE	60.33	47.79	32.54	67.26	52.84
Capital productivity	%	25.74	28.49	12.23	28.79	17.34
Financial Position	%	44.23	69.63	19.93	41.95	49.29
Future expectations of the industry	%	0.00	0.01	-0.01	0.00	0.00

Year 2008

Species	Total Turnover Value (Euro)	Total Weight of Sales	Seg. 5.1 value	Seg. 5.1 weight	Seg. 5.2 value	Seg. 5.2 weight	Seg. 5.3 value	Seg. 5. 3 weight	Seg. 5.4 value	Seg. 5.4 weight
Atlantic salmon	2731984	115	1886416	80	273557	11	0	0	572011	24
Chars nei	113936	19	8746	1	29174	6	0	0	76016	12
European whitefish	4652119	798	1650122	202	409065	67	975478	69	1617454	460
Grayling	242118	7	128153	4	13600	0	26076	1	74289	2
Lake salmon	206354	13	141465	9	0	0	0	0	64889	4
Lake trout(=Char)	1888845	239	702734	79	386354	59	2310	0	797447	101
Northern pike	19234	0	8137	0	0	0	8682	0	2415	0
Other	504345	67	189000	25	306000	41	0	0	9345	1
Pike-perch	2147577	22	184785	2	29000	0	1933659	20	133	0
Rainbow trout	22236514	12115	3330611	600	5250709	1499	0	0	13655194	10016
Roach	100	0	0	0	0	0	100	0	0	0
Sea trout	1779855	188	1146048	112	45000	9	0	0	588807	67

Year 2009

Species	Turnover Value (Euro)	Weight of Sales	Seg. 5.1 value	Seg. 5.1 weight	Seg. 5.2 value	Seg. 5.2 weight	Seg. 5.3 value	Seg. 5. 3 weight	Seg. 5.4 value	Seg. 5.4 weight
Atlantic salmon	2765842	119	2423937	101	211640	9	0	0	130265	9
Chars nei	190675	24	40840	6	34603	8	0	0	115232	10
European whitefish	5310639	799	2149630	239	795237	112	1029018	73	1336754	375
Grayling	252403	9	100232	3	17000	1	20913	1	114258	4
Lake salmon	344472	22	313935	19	0	0	0	0	30537	3
Lake sturgeon	6635	3	0	0	6635	3	0	0	0	0
Lake trout(=Char)	1764720	242	851452	113	273009	50	2700	0	637559	79
Northern pike	13228	0	0	0	0	0	13228	0	0	0
Other	754250	93	47101	6	521422	64	1260	1	184467	22
Pike-perch	1694068	17	41540	0	5070	0	1647458	17	0	0
Rainbow trout	22836647	11803	9945167	2402	4443137	1609	0	0	8448343	7792
Roach	1320	1	0	0	0	0	1320	1	0	0
Sea trout	1955462	185	1471423	138	37240	8	0	0	446799	39

France

Year 2008 – part 1

Variable	unit	total	Seg. 2.2	Seg. 2.3	Seg. 3.1	Seg. 3.2	Seg. 3.4
Turnover	000 EURO	809986.47	54158.37	96202.07	15909.8	18366.8	17745.75
Subsidies	000 EURO						
Other income	EURO						
Total income	EURO						
Wages and salaries	EURO						
Imputed value of unpaid labour	EURO						
Energy costs	EURO						
Raw material costs: Feed costs	EURO						
Raw material costs: Livestock costs	EURO						
Repair and maintenance	EURO						
Other operational costs	EURO						
Depreciation of capital	EURO						
Financial costs, net	EURO						
Extraordinary costs, net	EURO						
Total value of assets	EURO						
Net Investments	EURO						
Debt	EURO						
Raw material volume: Feed	TONNE						
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE	257268.95	17521.52	23281.38	179.9	3140.6	2828.97
Male employees	NUMBER	10250	512	510	103	137	165
Female employees	NUMBER	5711	110	236	51	29	36
Total employees	NUMBER	15961	622	746	154	166	201
Male FTE	NUMBER	1809.93	123.48	84.96	10.60	12.73	25.76
Female FTE	NUMBER	1613.78	63.75	58.33	11.40	16.5	21.25
FTE	NUMBER	3423.7	187.23	143.28	21.99	29.23	47.01
Number of enterprises <=5 employees	NUMBER	2221	193	97	0	1	9
Number of enterprises 6-10 employees	NUMBER	364	19	16	0	2	6
Number of enterprises >10 employees	NUMBER	279	5	11	5	3	5
Number of enterprises	NUMBER	2864	217	124	5	6	20
Employment per firm	EURO	5.57	2.87	6.02	30.80	27.67	10.05
FTE per firm	EURO	1.20	0.86	1.16	4.40	4.87	2.35
Mean wage	EURO						
Total production costs	EURO						
Gross Added Value	000 EURO						
Operating Cash Flow	EURO						
EBIT	000 EURO						
Net Profit	EURO						
Return on investment	%						
Running cost to turnover ratio	%						
EBIT to turnover ratio	%						
Labour productivity	000 €/FTE						
Capital productivity	%						
Financial Position	%						
Future expectations of the industry	%						

Year 2008 – part 2

Variable	unit	total	Seg. 7.1	Seg. 7.2	Seg. 7. 3	Seg. 8. 1	Seg. 8. 3
Turnover	000 EURO	809986.47	14757.87	8988.66	112079.15	19055.75	452722.26
Subsidies	000 EURO						
Other income	EURO						
Total income	EURO						
Wages and salaries	EURO						
Imputed value of unpaid labour	EURO						
Energy costs	EURO						
Raw material costs: Feed costs	EURO						
Raw material costs: Livestock costs	EURO						
Repair and maintenance	EURO						
Other operational costs	EURO						
Depreciation of capital	EURO						
Financial costs, net	EURO						
Extraordinary costs, net	EURO						
Total value of assets	EURO						
Net Investments	EURO						
Debt	EURO						
Raw material volume: Feed	TONNE						
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE	257268.95	9107.5	5167.05	61883.09	6828.38	127330.56
Male employees	NUMBER	10250	156	146	1219	333	6969
Female employees	NUMBER	5711	70	31	218	133	4797
Total employees	NUMBER	15961	226	177	1437	466	11766
Male FTE	NUMBER	1809.93	32.54	32.01	160.90	70.09	1256.87
Female FTE	NUMBER	1613.78	7.56	11.96	87.79	67.84	1267.41
FTE	NUMBER	3423.7	40.09	43.97	248.68	137.93	2524.28
Number of enterprises <=5 employees	NUMBER	2221	40	28	243	214	1396
Number of enterprises 6-10 employees	NUMBER	364	0	4	53	10	254
Number of enterprises >10 employees	NUMBER	279	3	5	19	0	223
Number of enterprises	NUMBER	2864	43	37	315	224	1873
Employment per firm	EURO	5.57	5.26	4.78	4.56	2.08	6.28
FTE per firm	EURO	1.20	0.93	1.19	0.79	0.62	1.35
Mean wage	EURO						
Total production costs	EURO						
Gross Added Value	000 EURO						
Operating Cash Flow	EURO						
EBIT	000 EURO						
Net Profit	EURO						
Return on investment	%						
Running cost to turnover ratio	%						
EBIT to turnover ratio	%						
Labour productivity	000 €/FTE						
Capital productivity	%						
Financial Position	%						
Future expectations of the industry	%						

Year 2009 – part 1

Variable	unit	total	Seg. 2.2	Seg. 2.3	Seg. 3.1	Seg. 3.2	Seg. 3.4
Turnover	000 EURO	760066.82	128406.11	17616.06	14959	14170.7	15103.99
Subsidies	000 EURO						
Other income	EURO						
Total income	EURO						
Wages and salaries	EURO						
Imputed value of unpaid labour	EURO						
Energy costs	EURO						
Raw material costs: Feed costs	EURO						
Raw material costs: Livestock costs	EURO						
Repair and maintenance	EURO						
Other operational costs	EURO						
Depreciation of capital	EURO						
Financial costs, net	EURO						
Extraordinary costs, net	EURO						
Total value of assets	EURO						
Net Investments	EURO						
Debt	EURO						
Raw material volume: Feed	TONNE						
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE	265398.6	38368.08	4322.58	165.72	2395	2111.62
Male employees	NUMBER	11240	821	255	93	98	151
Female employees	NUMBER	6224	313	104	37	34	32
Total employees	NUMBER	17464	1134	359	130	132	183
Male FTE	NUMBER	2074.20	140.92	63.58	5.32	4.31	23.36
Female FTE	NUMBER	1615.93	94.65	24.95	13.27	19.50	12.79
FTE	NUMBER	3690.13	235.57	88.52	18.58	23.81	36.15
Number of enterprises <=5 employees	NUMBER	2277	211	67	1	2	12
Number of enterprises 6-10 employees	NUMBER	385	21	10	0	1	5
Number of enterprises >10 employees	NUMBER	324	16	8	4	2	3
Number of enterprises	NUMBER	2986	248	85	5	5	20
Employment per firm	EURO	5.85	4.57	4.22	26.00	26.4	9.15
FTE per firm	EURO	1.24	0.95	1.04	3.72	4.76	1.81
Mean wage	EURO						
Total production costs	EURO						
Gross Added Value	000 EURO						
Operating Cash Flow	EURO						
EBIT	000 EURO						
Net Profit	EURO						
Return on investment	%						
Running cost to turnover ratio	%						
EBIT to turnover ratio	%						
Labour productivity	000 €/FTE						
Capital productivity	%						
Financial Position	%						
Future expectations of the industry	%						

Year 2009 – part 2

Variable	unit	total	Seg. 7.1	Seg. 7.2	Seg. 7. 3	Seg. 8. 1	Seg. 8. 3	Seg. 8.4
Turnover	000 EURO	760066.82	18496.42	7347.65	119431.46	13417.23	401836.21	9282
Subsidies	000 EURO							
Other income	EURO							
Total income	EURO							
Wages and salaries	EURO							
Imputed value of unpaid labour	EURO							
Energy costs	EURO							
Raw material costs: Feed costs	EURO							
Raw material costs: Livestock costs	EURO							
Repair and maintenance	EURO							
Other operational costs	EURO							
Depreciation of capital	EURO							
Financial costs, net	EURO							
Extraordinary costs, net	EURO							
Total value of assets	EURO							
Net Investments	EURO							
Debt	EURO							
Raw material volume: Feed	TONNE							
Raw material volume: Livestock	TONNE							
Total sales volume	TONNE	265398.6	11993.1	6205.7	65768.58	5744.79	123873.87	4449.57
Male employees	NUMBER	11240	188	105	1368	483	7502	176
Female employees	NUMBER	6224	69	11	250	211	5088	75
Total employees	NUMBER	17464	257	116	1618	694	12590	251
Male FTE	NUMBER	2074.20	32.83	26.24	211.27	186.43	1346.87	33.08
Female FTE	NUMBER	1615.93	7.33	9.46	89.19	97.21	1229.52	18.05
FTE	NUMBER	3690.13	40.17	35.70	300.46	283.64	2576.40	51.13
Number of enterprises <=5 employees	NUMBER	2277	32	25	249	238	1430	10
Number of enterprises 6-10 employees	NUMBER	385	2	4	61	11	261	9
Number of enterprises >10 employees	NUMBER	324	5	2	27	7	243	7
Number of enterprises	NUMBER	2986	39	31	337	256	1934	26
Employment per firm	EURO	5.85	6.59	3.74	4.80	2.71	6.51	9.65
FTE per firm	EURO	1.24	1.03	1.15	0.89	1.11	1.33	1.97
Mean wage	EURO							
Total production costs	EURO							
Gross Added Value	000 EURO							
Operating Cash Flow	EURO							
EBIT	000 EURO							
Net Profit	EURO							
Return on investment	%							
Running cost to turnover ratio	%							
EBIT to turnover ratio	%							
Labour productivity	000 €/FTE							
Capital productivity	%							
Financial Position	%							
Future expectations of the industry	%							

Year 2008 – part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 2.3 value	Seg. 2.3 weight	Seg. 3.1 value	Seg. 3.1 weight	Seg. 3.2 value	Seg. 3.2 weight	Seg. 3.4 value	Seg. 3.4 weight
Blue mussel	121557246	61532.02										
Common carp	68743	22.95	33100	10.35	35643	12.6						
European flat oyster	25294215	2206.97										
European seabass	31469625	4279.22					6346700	83.83	14361100	2521	10761825	1674.4
Freshwater fishes nei	26240100	3011.52	642900	9.1	25597200	3002.42						
Gilthead seabream	13489524	1290.63					5666600	74.9	3935700	609.6	3887224	606.13
Kuruma prawn	14157050	515.73										
Marine fishes nei	14037450	598.83										
Meagre	7063200	579.62					3896500	21.18	70000	10	3096700	548.45
Mediterranean mussel	36094931	13153.14										
Northern pike	2489368	44.5	38000	3.8	2451368	40.7						
Pacific cupped oyster	377103358	130960.33										
Rainbow trout	113520643	36546.42	51569319	17181.2	61951324	19365.18						
Roaches nei	258172	48.6	143700	27.3	114472	21.3						
Salmonoids nei	1502002	200.8	177137	28.8	1324865	171.99						
Sea trout	6203489	913.21	1502510	250.96	4700979	662.25						
Sturgeons nei	19600	3.64	14500	3	5100	0.64						
Tench	58315	11.27	37200	6.97	21115	4.3						
Clams, etc. nei	19359438	1349.57										

Year 2008 – part 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 7.1 value	Seg. 7.1 weight	Seg. 7.2 value	Seg. 7.2 weight	Seg. 7.3 value	Seg. 7.3 weight	Seg. 8.1 value	Seg. 8.1 weight	Seg. 8.3 value	Seg. 8.3 weight
Blue mussel	121557246	61532.02	225258	265	1233234	640.48	102359418	59154.03	2057756	343.19	15681580	1129.31
Common carp	68743	22.95										
European flat oyster	25294215	2206.97					1617504	347.12			23676711	1859.85
European seabass	31469625	4279.22										
Freshwater fishes nei	26240100	3011.52										
Gilthead seabream	13489524	1290.63										
Kuruma prawn	14157050	515.73									14157050	515.73
Marine fishes nei	14037450	598.83	44000	91							13993450	507.83
Meagre	7063200	579.62										
Mediterranean mussel	36094931	13153.14	12337512	8014.8	6282112	4075.98	1675104	391.32	1768721	132.29	14031482	538.75
Northern pike	2489368	44.5										
Pacific cupped oyster	377103358	130960.33	1609800	584.3	1473318	450.58	4563216	1606.72	13655889	6333.51	355801135	121985.22
Rainbow trout	113520643	36546.42										
Roaches nei	258172	48.6										
Salmonoids nei	1502002	200.8										
Sea trout	6203489	913.21										
Sturgeons nei	19600	3.64										
Tench	58315	11.27										
Clams, etc. nei	19359438	1349.57	541300	152.4			1863904	383.92	1573379	19.39	15380855	793.87

Year 2009 – part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 2.3 value	Seg. 2.3 weight	Seg. 3.1 value	Seg. 3.1 weight	Seg. 3.2 value	Seg. 3.2 weight	Seg. 3.4 value	Seg. 3.4 weight
Blue mussel	124195360	68858.37										
Common carp	99198	28.6	86257	24.2	12941	4.4						
European flat oyster	9580844	1213.11										
European seabass	26167847	2984.35					6324000	87.82	9491600	1488.5	10352247	1408.04
Freshwater fishes nei	20015958	2636.56	19989435	2633.86	26523	2.7						
Gilthead seabream	13725540	1366.02					6373000	66.74	4679100	906.5	2673440	392.79
Kuruma prawn	255200	12										
Marine fishes nei	153277	8.54										
Meagre	4326100	318.96					2262000	11.17			2064100	307.8
Mediterranean mussel	22690773	15720.2										
Northern pike	58959	5.4	45300	4.2	13659	1.2						
Pacific cupped oyster	409902507	131710.42										
Rainbow trout	118437134	38890.84	104962329	35138.75	13460605	3749.09					14200	3
Roaches nei	268038	52.9	237348	45.8	30690	7.1						
Salmonoids nei	1462878	214.79	435222	74.76	1027656	140.03						
Sea trout	5629907	851.47	2602746	437.11	3027161	414.36						
Sturgeons nei	7500	1.4	5500	0.6	2000	0.8						
Tench	56802	11.7	41972	8.8	14830	2.9						
Clams, etc. nei	3033002	512.96										

Year 2009 – part 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 2.3 value	Seg. 2.3 weight	Seg. 3.1 value	Seg. 3.1 weight	Seg. 3.2 value	Seg. 3.2 weight	Seg. 3.4 value	Seg. 3.4 weight
Blue mussel	124195360	68858.37										
Common carp	99198	28.6	86257	24.2	12941	4.4						
European flat oyster	9580844	1213.11										
European seabass	26167847	2984.35					6324000	87.82	9491600	1488.5	10352247	1408.04
Freshwater fishes nei	20015958	2636.56	19989435	2633.86	26523	2.7						
Gilthead seabream	13725540	1366.02					6373000	66.74	4679100	906.5	2673440	392.79
Kuruma prawn	255200	12										
Marine fishes nei	153277	8.54										
Meagre	4326100	318.96					2262000	11.17			2064100	307.8
Mediterranean mussel	22690773	15720.2										
Northern pike	58959	5.4	45300	4.2	13659	1.2						
Pacific cupped oyster	409902507	131710.42										
Rainbow trout	118437134	38890.84	104962329	35138.75	13460605	3749.09					14200	3
Roaches nei	268038	52.9	237348	45.8	30690	7.1						
Salmonoids nei	1462878	214.79	435222	74.76	1027656	140.03						
Sea trout	5629907	851.47	2602746	437.11	3027161	414.36						
Sturgeons nei	7500	1.4	5500	0.6	2000	0.8						
Tench	56802	11.7	41972	8.8	14830	2.9						
Clams, etc. nei	3033002	512.96										

Germany

Year 2008 and 2009

		2008		2009	
Variable	**unit**	**Sum of value**	**Seg. 7.3**	**Sum of value**	**Seg. 7.3**
Turnover	000 EURO	9695.30	9695.30	5015.78	5015.78
Subsidies	000 EURO	36.33	36.33	15.04	15.04
Other income	EURO	93420	93420	38644	38644
Total income	EURO	9825049.90	9825049.90	5069461.00	5069461.00
Wages and salaries	EURO	1114120	1114120	1856912	1856912
Imputed value of unpaid labour	EURO	15300	15300	0	0
Energy costs	EURO	1194343	1194343	547443	547443
Raw material costs: Feed costs	EURO	0	0	0	0
Raw material costs: Livestock costs	EURO	0	0	429624	429624
Repair and maintenance	EURO	603466	603466	335640	335640
Other operational costs	EURO	1368953	1368953	1060147	1060147
Depreciation of capital	EURO	1538928	1538928	387447	387447
Financial costs, net	EURO	277830	277830	186390	186390
Extraordinary costs, net	EURO	0	0	0	0
Total value of assets	EURO	14700000	14700000	14337690	14337690
Net Investments	EURO	485127	485127	114246	114246
Debt	EURO	3969000	3969000	2867540	2867540
Raw material volume: Feed	TONNE	0	0	0	0
Raw material volume: Livestock	TONNE				
Total sales volume	TONNE	6750.13	6750.13	3959.74	3959.74
Male employees	NUMBER	10	10	10	10
Female employees	NUMBER	0	0	0	0
Total employees	NUMBER	10	10	10	10
Male FTE	NUMBER	9	9	7	7
Female FTE	NUMBER	0	0	0	0
FTE	NUMBER	9	9	7	7
Number of enterprises <=5 employees	NUMBER	8	8	12	12
Number of enterprises 6-10 employees	NUMBER	0	0	0	0
Number of enterprises >10 employees	NUMBER	0	0	0	0
Number of enterprises	NUMBER	8	8	12	12
Employment per firm	EURO	1.25	1.25	0.83	0.83
FTE per firm	EURO	1.13	1.13	0.58	0.58
Mean wage	EURO	125491.11	125491.11	265273.14	265273.14
Total production costs	EURO	4296182	4296182	4229766	4229766
Gross Added Value	000 EURO	6621.96	6621.96	2681.57	2681.57
Operating Cash Flow	EURO	5528867.9	5528867.90	839695	839695.00
EBIT	000 EURO	3989.94	3989.94	452.25	452.25
Net Profit	EURO	3712109.9	3712109.90	265858	265858.00
Return on investment	%	27.14	27.14	3.15	3.15
Running cost to turnover ratio	%	44.31	44.31	84.33	84.33
EBIT to turnover ratio	%	41.15	41.15	9.02	9.02
Labour productivity	000 €/FTE	735.77	735.77	383.08	383.08
Capital productivity	%	45.05	45.05	18.70	18.70
Financial Position	%	73	73	80	80
Future expectations of the industry	%	0.07	0.07	0.02	0.02

Year 2008

Species	**Total Turnover Value (Euro)**	**Total Weight of Sales (Tonnes)**	**Seg. 7. 3 value**	**Seg. 7. 3 weight**
Mytilus edulis	9695299.9	6750128	9695299.9	6750128

Year 2009

Species	**Total Turnover Value (Euro)**	**Total Weight of Sales (Tonnes)**	**Seg. 7. 3 value**	**Seg. 7. 3 weight**
Mytilus edulis	5015780.81	3959740	5015780.81	3959740

Greece

Year 2008 – part 1

		total	Seg. 1.3	Seg. 2.3	Seg. 3.1	Seg. 3.4	Seg. 4.3
Turnover	000 EURO	375757.59	77.31	8814.00	78427.00	330616.00	488.90
Subsidies	000 EURO	4519.29					
Other income	EURO						
Total income	EURO						
Wages and salaries	EURO						
Imputed value of unpaid labour	EURO						
Energy costs	EURO						
Raw material costs: Feed costs	EURO						
Raw material costs: Livestock costs	EURO						
Repair and maintenance	EURO						
Other operational costs	EURO						
Depreciation of capital	EURO						
Financial costs, net	EURO						
Extraordinary costs, net	EURO						
Total value of assets	EURO						
Net Investments	EURO						
Debt	EURO						
Raw material volume: Feed	TONNE						
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE	114571.60	8.00	3390.00	373466539.00	85610.80	112.65
Male employees	NUMBER						
Female employees	NUMBER						
Total employees	NUMBER	6073					
Male FTE	NUMBER						
Female FTE	NUMBER						
FTE	NUMBER						
Number of enterprises <=5 employees	NUMBER***	721	4	75		96	6
Number of enterprises 6-10 employees	NUMBER***	221	0	6		148	2
Number of enterprises >10 employees	NUMBER***	96	0	0		89	0
Number of enterprises	NUMBER	1038	4	81		333	8
Employment per firm	EURO	5.85					
FTE per firm	EURO						
Mean wage	EURO						
Total production costs	EURO						
Gross Added Value	000 EURO						
Operating Cash Flow	EURO						
EBIT	000 EURO						
Net Profit	EURO						
Return on investment	%						
Running cost to turnover ratio	%						
EBIT to turnover ratio	%						
Labour productivity	000 €/FTE						
Capital productivity	%						
Financial Position	%						
Future expectations of the industry	%						

Year 2008 – part 2

		total	Seg. 5.2	Seg. 6.1	Seg. 6.4	Seg. 7.2	Seg. 8.2	Seg. 10.2
Turnover	000 EURO	375757.59	3854.74	1806.00	22913.64	8894.00	94.00	5.00
Subsidies	000 EURO	4519.29						
Other income	EURO							
Total income	EURO							
Wages and salaries	EURO							
Imputed value of unpaid labour	EURO							
Energy costs	EURO							
Raw material costs: Feed costs	EURO							
Raw material costs: Livestock costs	EURO							
Repair and maintenance	EURO							
Other operational costs	EURO							
Depreciation of capital	EURO							
Financial costs, net	EURO							
Extraordinary costs, net	EURO							
Total value of assets	EURO							
Net Investments	EURO							
Debt	EURO							
Raw material volume: Feed	TONNE							
Raw material volume: Livestock	TONNE							
Total sales volume	TONNE	114571.60	416.10	8757420.00	3834.67	21178.18	20.50	0.70
Male employees	NUMBER							
Female employees	NUMBER							
Total employees	NUMBER	6073						
Male FTE	NUMBER							
Female FTE	NUMBER							
FTE	NUMBER							
Number of enterprises <=5 employees	NUMBER***	721	3			537		
Number of enterprises 6-10 employees	NUMBER***	221	5			60		
Number of enterprises >10 employees	NUMBER***	96	0			7		
Number of enterprises	NUMBER	1038	8			604		
Employment per firm	EURO	5.85						
FTE per firm	EURO							
Mean wage	EURO							
Total production costs	EURO							
Gross Added Value	000 EURO							
Operating Cash Flow	EURO							
EBIT	000 EURO							
Net Profit	EURO							
Return on investment	%							
Running cost to turnover ratio	%							
EBIT to turnover ratio	%							
Labour productivity	000 €/FTE							
Capital productivity	%							
Financial Position	%							
Future expectations of the industry	%							

Year 2009 – part 1

Variable	unit	total	Seg. 1.3	Seg. 2.3	Seg. 3.1	Seg. 3.4	Seg. 4.3
Turnover	000 EURO	392113.56	77.25	6745.24	83352.00	346478.00	378.53
Subsidies	000 EURO	5019.63					
Other income	EURO						
Total income	EURO						
Wages and salaries	EURO						
Imputed value of unpaid labour	EURO						
Energy costs	EURO						
Raw material costs: Feed costs	EURO						
Raw material costs: Livestock costs	EURO						
Repair and maintenance	EURO						
Other operational costs	EURO						
Depreciation of capital	EURO						
Financial costs, net	EURO						
Extraordinary costs, net	EURO						
Total value of assets	EURO						
Net Investments	EURO						
Debt	EURO						
Raw material volume: Feed	TONNE						
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE	117924.85	7.50	2298.00	396913893.00	89441.80	96.00
Male employees	NUMBER						
Female employees	NUMBER						
Total employees	NUMBER	5947					
Male FTE	NUMBER						
Female FTE	NUMBER						
FTE	NUMBER						
Number of enterprises <=5 employees	NUMBER***	723	2	76		96	6
Number of enterprises 6-10 employees	NUMBER***	221	1	7		148	2
Number of enterprises >10 employees	NUMBER***	96	0	0		89	0
Number of enterprises	NUMBER	1040	3	83		333	8
Employment per firm	EURO	5.72					
FTE per firm	EURO						
Mean wage	EURO						
Total production costs	EURO						
Gross Added Value	000 EURO						
Operating Cash Flow	EURO						
EBIT	000 EURO						
Net Profit	EURO						
Return on investment	%						
Running cost to turnover ratio	%						
EBIT to turnover ratio	%						
Labour productivity	000 €/FTE						
Capital productivity	%						
Financial Position	%						
Future expectations of the industry	%						

Year 2009 – part 2

Variable	unit	total	Seg. 5.2	Seg. 6.1	Seg. 6.4	Seg. 7.2	Seg. 8.2	Seg. 10.2
Turnover	000 EURO	392113.56	3502.96	2014.00	25919.57	8899.00	98.00	15.00
Subsidies	000 EURO	5019.63						
Other income	EURO							
Total income	EURO							
Wages and salaries	EURO							
Imputed value of unpaid labour	EURO							
Energy costs	EURO							
Raw material costs: Feed costs	EURO							
Raw material costs: Livestock costs	EURO							
Repair and maintenance	EURO							
Other operational costs	EURO							
Depreciation of capital	EURO							
Financial costs, net	EURO							
Extraordinary costs, net	EURO							
Total value of assets	EURO							
Net Investments	EURO							
Debt	EURO							
Raw material volume: Feed	TONNE							
Raw material volume: Livestock	TONNE							
Total sales volume	TONNE	117924.85	378.00	8757420.00	4492.26	21187.75	21.42	2.12
Male employees	NUMBER							
Female employees	NUMBER							
Total employees	NUMBER	5947						
Male FTE	NUMBER							
Female FTE	NUMBER							
FTE	NUMBER							
Number of enterprises <=5 employees	NUMBER***	723	6			537		
Number of enterprises 6-10 employees	NUMBER***	221	3			60		
Number of enterprises >10 employees	NUMBER***	96	0			7		
Number of enterprises	NUMBER	1040	9			604		
Employment per firm	EURO	5.72						
FTE per firm	EURO							
Mean wage	EURO							
Total production costs	EURO							
Gross Added Value	000 EURO							
Operating Cash Flow	EURO							
EBIT	000 EURO							
Net Profit	EURO							
Return on investment	%							
Running cost to turnover ratio	%							
EBIT to turnover ratio	%							
Labour productivity	000 €/FTE							
Capital productivity	%							
Financial Position	%							
Future expectations of the industry	%							

Year 2008 – part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 1.3 value	Seg. 1.3 weight	Seg. 2.3 value	Seg. 2.3 weight	Seg. 3.1 value	Seg. 3.1 weight	Seg. 3.4 value	Seg. 3.4 weight	Seg. 4.3 value	Seg. 4.3 weight	Seg. 5.3 value	Seg. 5.3 weight
Carp	488901	112.65									488901	112.65		
Mussel	8894000	21178.18												
Other freshwater fish	3854740	416.1											3854740	416.1
Other marine fish	22913640	3834.67												
Other shellfish	5000	0.7												
Oyster	94000	20.5												
Salmon	77312	8	77312	8										
Sea Bass & Sea Bream	330616000	85610.8					78427000	373466539	3.3E+08	85610.8				
Trout	8814000	3390			8814000	3390								

Year 2008 – part 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 6.1 value	Seg. 6.1 weight	Seg. 6.4 value	Seg. 6.4 weight	Seg. 7.2 value	Seg. 7.2 weight	Seg. 8.2 value	Seg. 8.2 weight	Seg. 10.2 value	Seg. 10.2 weight
Carp	488901	112.65										
Mussel	8894000	21178.18					8894000	21178.18				
Other freshwater fish	3854740	416.1										
Other marine fish	22913640	3834.67	1806000	7853586	22913640	3834.67						
Other shellfish	5000	0.7									5000	0.7
Oyster	94000	20.5							94000	20.5		
Salmon	77312	8										
Sea Bass & Sea Bream	330616000	85610.8										
Trout	8814000	3390										

Year 2009 – part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 1.3 value	Seg. 1.3 weight	Seg. 2.3 value	Seg. 2.3 weight	Seg. 3.1 value	Seg. 3.1 weight	Seg. 3.4 value	Seg. 3.4 weight	Seg. 4.3 value	Seg. 4.3 weight	Seg. 5.3 value	Seg. 5.3 weight
Carp	378528	96									378528	96		
Mussel	8899000	21187.75												
Other freshwater fish	3502962	378											3502962	378
Other marine fish	25919573	4492.26												
Other shellfish	15000	2.12												
Oyster	98000	21.42												
Salmon	77250	7.5	77250	7.5										
Sea Bass & Sea Bream	346478000	89441.8					83352000	396913893	346478000	89441.8				
Trout	6745242	2298			6745242	2298								

Year 2009 – part 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 6.1 value	Seg. 6.1 weight	Seg. 6.4 value	Seg. 6.4 weight	Seg. 7.2 value	Seg. 7.2 weight	Seg. 8.2 value	Seg. 8.2 weight	Seg. 10.2 value	Seg. 10.2 weight
Carp	378528	96										
Mussel	8899000	21187.75					8899000	21187.75				
Other freshwater fish	3502962	378										
Other marine fish	25919573	4492.26	2014000	4816581	25919573	4492.26						
Other shellfish	15000	2.12									15000	2.12
Oyster	98000	21.42							98000	21.42		
Salmon	77250	7.5										
Sea Bass & Sea Bream	346478000	89441.8										
Trout	6745242	2298										

Ireland

Year 2008 – part 1

Variable	unit	total	Seg. 1.1	Seg. 1.3	Seg. 2.2	Seg. 5.3	Seg. 7.2	Seg. 7.3
Turnover	000 EURO	93892.19	1151.5	47117.02	2223	537.85	6418.17	17294.29
Subsidies	000 EURO	0			0		0	0
Other income	EURO	1078176.67			38004.82		336200	6844.16
Total income	EURO	94970361	1151500	47117018	2261004.82	537850	6754369	17301134.20
Wages and salaries	EURO	31530107.01			489007.23		1829600	2271733.77
Imputed value of unpaid labour	EURO							
Energy costs	EURO	2066103.65			109583.13		166600	188006.49
Raw material costs: Feed costs	EURO	872673.10			415915.66		0	0
Raw material costs: Livestock costs	EURO	26254330.68			535292.77		247750	7236974.03
Repair and maintenance	EURO	10025577			63702.41		643575	3157279.22
Other operational costs	EURO	24328004.62			400866.27		2262500	4253512.99
Depreciation of capital	EURO	8601252.62			128731.33		226075	1641636.36
Financial costs, net	EURO	3095262.27			84268.67		10775	1049902.6
Extraordinary costs, net	EURO	0			0		0	0
Total value of assets	EURO	129092717.20			4070931.33		15875525	4419162.34
Net Investments	EURO	4353755.77			0		2075000	0
Debt	EURO	53920511.96			2317533.74		7646075	2726597.40
Raw material volume: Feed	TONNE				0		0	0
Raw material volume: Livestock	TONNE	24.76			0.08		8825	15294
Total sales volume	TONNE	45008.70	136.00	9218.00	799.00	36.40	10067.00	16993.00
Male employees	NUMBER	1802	41	136	16	29	302	192
Female employees	NUMBER	162	4	5	3	7	60	27
Total employees	NUMBER	1964	45	141	19	36	362	219
Male FTE	NUMBER	1052.00	33.50	119.83	14.67	25.67	193.00	206.00
Female FTE	NUMBER	60	2	2.5	1.5	3.5	20	13
FTE	NUMBER	1281.00	35.50	122.33	16.70	29.17	213.00	177.67
Number of enterprises <=5 employees	NUMBER	233	11	7	4	5	57	20
Number of enterprises 6-10 employees	NUMBER	42	1	2	2	0	9	12
Number of enterprises >10 employees	NUMBER	30	0	7	0	0	4	4
Number of enterprises	NUMBER	305	12	16	6	5	70	36
Employment per firm	EURO	6.44	3.75	8.81	3.17	7.2	5.17	6.08
FTE per firm	EURO	4.2	2.96	7.65	2.78	5.83	3.04	4.94
Mean wage	EURO	24613.67			29281.87		8589.67	12786.25
Total production costs	EURO	95076796.06			2014367.47		5150025	17107506.5
Gross Added Value	000 EURO	31423.67			735.64		3433.94	2465.36
Operating Cash Flow	EURO	-106435.06			246637.35		1604344	193627.7
EBIT	000 EURO	-8707.69			117.91		1378.27	-1448.01
Net Profit	EURO	-11802949.95			33637.35		1367494	-2497911.26
Return on investment	%	-6.75			2.9		8.68	-32.77
Running cost to turnover ratio	%	101.26			90.61		80.24	98.92
EBIT to turnover ratio	%	-9.27			5.3		21.47	-8.37
Labour productivity	000 €/FTE	24.53			44.05		16.12	13.88
Capital productivity	%	24.34			18.07		21.63	55.79
Financial Position	%	58.23			43.07		51.84	38.3
Future expectations of the industry	%	0.03			0.03		-0.12	0.37

Year 2008 – part 2

Variable	unit	total	Seg. 8.3	Seg. 8.4	Seg. 9.3	Seg. 10.3	Seg. 10.4
Turnover	000 EURO	93892.19	1321.75	12469.47	1188.5	339.25	156.39
Subsidies	000 EURO	0	0	0	0	0	0
Other income	EURO	1078176.67	1186.05	0	20786	0	0
Total income	EURO	94970361	1322936.05	12469469	1209286	339250	156389
Wages and salaries	EURO	31530107.01	87052.33	9188483.69	413618		257502.44
Imputed value of unpaid labour	EURO						
Energy costs	EURO	2066103.65	0	387140.12	75741		57634.15
Raw material costs: Feed costs	EURO	872673.10	0	0	0	0	
Raw material costs: Livestock costs	EURO	26254330.68	0	4095470.25	222727		174600
Repair and maintenance	EURO	10025577	10693.02	775182.34	113341		14417.07
Other operational costs	EURO	24328004.62	109363.95	3407351.25	158977		78848.78
Depreciation of capital	EURO	8601252.62	1466.28	1387523.99	42141		155834.15
Financial costs, net	EURO	3095262.27	3202.33	117120.92	24864		123326.83
Extraordinary costs, net	EURO	0	0	0	0		0
Total value of assets	EURO	129092717.20	695211.63	29038234.20	1406227		3634651.20
Net Investments	EURO	4353755.77	0	0	0		0
Debt	EURO	53920511.96	695211.63	8315854.13	284423		2031200
Raw material volume: Feed	TONNE		0	0	0	0	0
Raw material volume: Livestock	TONNE	24.76	294	349.81	1		0.24
Total sales volume	TONNE	45008.70	389.00	6188.00	187.00	59.00	4.00
Male employees	NUMBER	1802	524	458	31	35	19
Female employees	NUMBER	162	0	41	4	6	3
Total employees	NUMBER	1964	524	499	35	41	22
Male FTE	NUMBER	1052.00	265.50	325.50	18.00	22.17	15.50
Female FTE	NUMBER	60	0	21	2	3	1.5
FTE	NUMBER	1281.00	265.50	346.50	20.00	25.70	17.00
Number of enterprises <=5 employees	NUMBER	233	2	110	3	4	7
Number of enterprises 6-10 employees	NUMBER	42	0	11	2	1	1
Number of enterprises >10 employees	NUMBER	30	4	9	1	1	0
Number of enterprises	NUMBER	305	6	130	6	6	8
Employment per firm	EURO	6.44	87.33	3.84	5.83	6.83	2.75
FTE per firm	EURO	4.2	44.25	2.67	3.33	4.28	2.13
Mean wage	EURO	24613.67	327.88	26517.99	20680.9		15147.2
Total production costs	EURO	95076796.06	207109.3	17853627.65	984404		583002.44
Gross Added Value	000 EURO	31423.67	1202.88	3804.33	638.5	339.25	-169.11
Operating Cash Flow	EURO	-106435.06	1115826.75	-5384158.65	224882		-426613.44
EBIT	000 EURO	-8707.69	1114.36	-6771.68	182.74		-582.45
Net Profit	EURO	-11802949.95	1111158.14	-6888803.56	157877		-705774.42
Return on investment	%	-6.75	160.29	-23.32	13		-16.02
Running cost to turnover ratio	%	101.26	15.67	143.18	82.83		372.79
EBIT to turnover ratio	%	-9.27	84.31	-54.31	15.38		-372.44
Labour productivity	000 €/FTE	24.53	4.53	10.98	31.93	13.2	-9.95
Capital productivity	%	24.34	173.02	13.1	45.41		-4.65
Financial Position	%	58.23		71.36	79.77		44.12
Future expectations of the industry	%	0.03	0	0.05	0.03		0.04

Year 2009 – part 1

Variable	unit	total	Seg. 1.1	Seg. 1.3	Seg. 2.2	Seg. 5.3	Seg. 7.2	Seg. 7.3
Turnover	000 EURO	106566.4	1873.5	65368.03	2578.53	505.5	4713.1	13213.05
Subsidies	000 EURO	76.61	0	0	0.51		0	0
Other income	EURO	1544383	19065.69	0	38943.21	29000	836786.76	3342
Total income	EURO	108187395	1892565.69	65368033	2617980.56	534500	5549881.77	13216392
Wages and salaries	EURO	24997515	643503.64	13411079	463633.33	114000	1496080.88	2230021
Imputed value of unpaid labour	EURO	3982866	4208.36	0	0	85296	629743.1	593339
Energy costs	EURO	1643554	132740.88	728863	129018.52	71500	87404.41	66374
Raw material costs: Feed costs	EURO	28068971	345716.31	27259475	398779.01	65000	0	0
Raw material costs: Livestock costs	EURO	10853540	35233.58	0	489839.51	17000	498007.35	3773021
Repair and maintenance	EURO	7541899	89645.98	3206997	34928.39	13000	330306.45	3201094
Other operational costs	EURO	26071905	558072.99	17201166	315434.57	43000	747852.94	3347563
Depreciation of capital	EURO	4441132	94171.53		124648.15	29800	411882.35	1737968
Financial costs, net	EURO	1200887	15580.29	0	52196.3	0	112080.88	570689
Extraordinary costs, net	EURO	0	0	0	0	0	0	0
Total value of assets	EURO	166938721	2474364.96	68513120	4669756.79	1552000	23904161.76	26724600
Net Investments	EURO	17184691	0	0	0	0	16918536.76	0
Debt	EURO	63539375	1340883.21	21428571	2091864.2	1500000	4263235.29	3337700
Raw material volume: Feed	TONNE	890	0	843	0	47	0	0
Raw material volume: Livestock	TONNE	71350	0.04	13	0.11	0.22	8176.47	15769
Total sales volume	TONNE	47407.6	196.6	12210	896	62	8981	17521
Male employees	NUMBER	1807	45	132	15	14	230	183
Female employees	NUMBER	144	6	12	4	2	16	26
Total employees	NUMBER	1952	49	144	19	16	246	209
Male FTE	NUMBER	909.69	37	113	15	11	120	157
Female FTE	NUMBER	66.3	2	6	2	1	8	13
FTE	NUMBER	976	39	119	17	12	128	170
Number of enterprises <=5 employees	NUMBER	232	11	7	4	5	57	20
Number of enterprises 6-10 employees	NUMBER	41	1	2	2	0	9	12
Number of enterprises >10 employees	NUMBER	30	0	7	0	0	4	4
Number of enterprises	NUMBER	303	12	16	6	5	70	36
Employment per firm	EURO	6.44	4.08	9	3.17	3.2	3.51	5.81
FTE per firm	EURO	3.22	3.25	7.44	2.83	2.4	1.83	4.72
Mean wage	EURO	29693.01	16608	112698.14	27272.55	16608	16608	16608
Total production costs	EURO	103160250	1809121.74	61807580	1831633.33	408796	3789395.13	13211412
Gross Added Value	000 EURO	33930.92	731.16	16971.53	1249.47	325	3886.31	2828.34
Operating Cash Flow	EURO	5027145	83443.95	3560453	786347.23	125704	1760486.64	4980
EBIT	000 EURO	586.01	-10.73		661.7	95.9	1348.6	-1732.99
Net Profit	EURO	-614874	-26307.87		609502.78	95904	1236523.41	-2303677
Return on investment	%	0.35	-0.43		14.17	6.18	5.64	-6.48
Running cost to turnover ratio	%	96.8	96.56	94.55	71.03	80.87	80.4	99.99
EBIT to turnover ratio	%	0.55	-0.57		25.66	18.97	28.61	-13.12
Labour productivity	000 €/FTE	34.77	18.75	142.62	73.5	27.08	30.36	16.64
Capital productivity	%	20.33	29.55	24.77	26.76	20.94	16.26	10.58
Financial Position	%	61.94	45.81	68.72	55.2	3.35	82.17	87.51
Future expectations of the industry	%	-0.08	0.04		0.03	0.02	-0.69	0.07

Year 2009 – part 2

Variable	unit	total	Seg. 8.3	Seg. 8.4	Seg. 9.3	Seg. 10.3	Seg. 10.4
Turnover	000 EURO	106566.4	1454.5	13685.22	1093	385.81	28.75
Subsidies	000 EURO	76.61	0	0	0	76.1	0
Other income	EURO	1544383	209.7	177088	5148.65	144175	238615.4
Total income	EURO	108187395	1454709.7	13862303	1098148.65	606084	267365.4
Wages and salaries	EURO	24997515	68635.15	4638797	302337.84	117407	1069346
Imputed value of unpaid labour	EURO	3982866	1974149	260563	46430.16	380833	0
Energy costs	EURO	1643554	0	130725	37272.97	38101	221553.8
Raw material costs: Feed costs	EURO	28068971	0	0	0	0	0
Raw material costs: Livestock costs	EURO	10853540	0	5464668	231578.95	0	344192.3
Repair and maintenance	EURO	7541899	6406.06	523613	61302.7	13190	61415.38
Other operational costs	EURO	26071905	79415.76	2528363	66351.35	59235	458753.8
Depreciation of capital	EURO	4441132	1375.76	1464805	25570.27	55126	495784.6
Financial costs, net	EURO	1200887	3869.09	110280	2724.32	18354	289507.7
Extraordinary costs, net	EURO	0	0	0	0	0	0
Total value of assets	EURO	166938721	529146.67	22455104	808775.68	1118911	12441638
Net Investments	EURO	17184691	0	266154	0	0	0
Debt	EURO	63539375	529146.67	18694747	133829.73	309536	8693715
Raw material volume: Feed	TONNE	890	0	0	0	0	0
Raw material volume: Livestock	TONNE	71350	363.64	821	0.73	46136	4.62
Total sales volume	TONNE	47407.6	358	6488	162	55.38	0.28
Male employees	NUMBER	1807	613	418	30	102	10
Female employees	NUMBER	144	6	44	15	7	5
Total employees	NUMBER	1952	619	462	45	109	15
Male FTE	NUMBER	909.69	120	273	17	26.5	7.32
Female FTE	NUMBER	66.3	3	22	4	3.5	1.68
FTE	NUMBER	976	123	295	21	30	9
Number of enterprises <=5 employees	NUMBER	232	2	110	3	4	7
Number of enterprises 6-10 employees	NUMBER	41	0	11	2	1	1
Number of enterprises >10 employees	NUMBER	30	4	9	1	1	0
Number of enterprises	NUMBER	303	6	130	6	6	8
Employment per firm	EURO	6.44	103.17	3.55	7.5	18.17	1.88
FTE per firm	EURO	3.22	20.5	2.27	3.5	5	1.13
Mean wage	EURO	29693.01	16608	16608	16608	16608	118816.22
Total production costs	EURO	103160250	2128605.97	13546729	745273.97	608766	2155261.28
Gross Added Value	000 EURO	33930.92	1368.89	5214.93	701.64	419.46	-818.55
Operating Cash Flow	EURO	5027145	-673896.27	315574	352874.68	-2682	-1887895.88
EBIT	000 EURO	586.01	-675.27	-1149.23	327.3	-57.81	-2383.68
Net Profit	EURO	-614874	-679141.12	-1259511	324580.09	-76162	-2673188.18
Return on investment	%	0.35	-127.62	-5.12	40.47	-5.17	-19.16
Running cost to turnover ratio	%	96.8	146.35	98.99	68.19	157.79	7496.56
EBIT to turnover ratio	%	0.55	-46.43	-8.4	29.95	-14.98	-8291.06
Labour productivity	000 €/FTE	34.77	11.13	17.68	33.41	13.98	-90.95
Capital productivity	%	20.33	258.7	23.22	86.75	37.49	-6.58
Financial Position	%	61.94		16.75	83.45	72.34	30.12
Future expectations of the industry	%	-0.08	0	0.05	0.03	0.05	0.04

Year 2008 – part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 1.1 value	Seg. 1.1 weight	Seg. 2.2 value	Seg. 2.2 weight	Seg. 2.4 value	Seg. 2.4 weight	Seg. 5.3 value	Seg. 5.3 weight	Seg. 7.2 value	Seg. 7.2 weight	Seg. 7.3 value	Seg. 7.3 weight
Bottom Mussel	17294290	16993											17294290	16993
Clam	1188500	187												
Freshwater Trout	2223000	799			2223000	799								
Gigas Oyster	12469469	6188												
Native Oyster	1321750	389												
Novel Shellfish	156389	4												
Other Freshwater Finfish	537850	36							537850	36				
Rope Mussel	6418169	10067									6418169	10067		
Salmon	47117018	9217												
Scallop	339250	59												
Seawater Trout	3675000	930					3675000	930						
Smolts	1151500	136	1151500	136										

Year 2008 – part 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 8.3 value	Seg. 8.3 weight	Seg. 8.4 value	Seg. 8.4 weight	Seg. 9.3 value	Seg. 9.3 weight	Seg. 10.3 value	Seg. 10.3 weight	Seg. 10.4 value	Seg. 10.4 weight
Bottom Mussel	17294290	16993										
Clam	1188500	187					1188500	187				
Freshwater Trout	2223000	799										
Gigas Oyster	12469469	6188			12469469	6188						
Native Oyster	1321750	389	1321750	389								
Novel Shellfish	156389	4									156389	4
Other Freshwater Finfish	537850	36										
Rope Mussel	6418169	10067										
Salmon	47117018	9217										
Scallop	339250	59							339250	59		
Seawater Trout	3675000	930										
Smolts	1151500	136										

Year 2009 – part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 1.1 value	Seg. 1.1 weight	Seg. 2.4 value	Seg. 2.4 weight	Seg. 5.3 value	Seg. 5.3 weight	Seg. 7.2 value	Seg. 7.2 weight	Seg. 7.3 value	Seg. 7.3 weight
Bottom Mussel	13213050	17521									13213050	17521
Clam	1093000	162										
Freshwater Trout	2578525	896										
Gigas Oyster	13685215	6488										
Native Oyster	1454500	358										
Novel Shellfish	28750	0.28										
Other Freshwater Finfish	505500	62					505500	62				
Rope Mussel	4713095	8981							4713095	8981		
Salmon	65368033	12211										
Scallop	385811	55.4										
Seawater Trout	1667422	478			1667422	478						
Smolts	1873500	197	1873500	197								

Year 2009 – part 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 8.3 value	Seg. 8.3 weight	Seg. 8.4 value	Seg. 8.4 weight	Seg. 9.3 value	Seg. 9.3 weight	Seg. 10.3 value	Seg. 10.3 weight	Seg. 10.4 value	Seg. 10.4 weight
Bottom Mussel	13213050	17521										
Clam	1093000	162					1093000	162				
Freshwater Trout	2578525	896										
Gigas Oyster	13685215	6488			13685215	6488						
Native Oyster	1454500	358	1454500	358								
Novel Shellfish	28750	0.28									28750	0.28
Other Freshwater Finfish	505500	62										
Rope Mussel	4713095	8981										
Salmon	65368033	12211										
Scallop	385811	55.4							385811	55.4		
Seawater Trout	1667422	478										
Smolts	1873500	197										

Italy

Year 2008 – part 1

Variable	unit	total	Seg. 2.2	Seg. 2.3	Seg. 3.2	Seg. 3.3	Seg. 3.4
Turnover	000 EURO	56649.16	2965.00	9510.00	6993.56	1671.22	1207.50
Subsidies	000 EURO	260.71	0.00	65.00	8.06	0.00	24.87
Other income	EURO	2311358.99	0.00	31000.00	425186.00	89180.48	39.00
Total income	EURO	59221223.39	2965000.00	9606000.00	7426805.00	1760403.66	1232410.00
Wages and salaries	EURO	18929450.43	490000.00	897000.00	1394708.00	490557.24	169111.00
Imputed value of unpaid labour	EURO	688500	117000	272000	0	0	11500
Energy costs	EURO	6445900.44	191000.00	801200.00	165000.00	126648.60	7824.00
Raw material costs: Feed costs	EURO	11251131.34	1555000.00	4855000.00	2471970.00	666294.34	114867.00
Raw material costs: Livestock costs	EURO	50265402.69	146500.00	969000.00	2657965.00	449551.24	802829.43
Repair and maintenance	EURO	4524549.68	38500.00	212000.00	199646.00	33222.98	20000.00
Other operational costs	EURO	8115569.52	6500.00	35500.00	62338.00	0.00	26831.00
Depreciation of capital	EURO	3556474.12	18000.00	83000.00	333400.00	39189.44	108765.00
Financial costs, net	EURO	2151992.36	39000.00	1327000.00	173322.00	3585.40	21290.00
Extraordinary costs, net	EURO	1528933.00	9000.00	48000.00	48433.00	0.00	600019.00
Total value of assets	EURO	56159098.94	1274000.00	1896000.00	16830369.00	2311275.05	1416944.92
Net Investments	EURO	8386925	0	105000	1048887	0	187869
Debt	EURO	51036341.31	0.00	0.00	17065369.00	2314171.22	54228.30
Raw material volume: Feed	TONNE	10979	1765	5225	2497	741	51
Raw material volume: Livestock	TONNE	633666	1556	4606	582	223	100
Total sales volume	TONNE	31810.93	1512.00	4341.00	808.00	230.60	252.00
Male employees	NUMBER	546	17	40	44	18	10
Female employees	NUMBER	69	3	11	3		
Total employees	NUMBER	615	20	51	47	18	10
Male FTE	NUMBER						
Female FTE	NUMBER						
FTE	NUMBER						
Number of enterprises <=5 employees	NUMBER						
Number of enterprises 6-10 employees	NUMBER						
Number of enterprises >10 employees	NUMBER						
Number of enterprises	NUMBER						
Employment per firm	EURO						
FTE per firm	EURO						
Mean wage	EURO	31899.11	30350	22921.57	29674.64	27253.18	18061.1
Total production costs	EURO	100220504.1	2544500	8041700	6951627	1766274.4	1152962.43
Gross Added Value	000 EURO	-21642.04	1027.5	2668.3	1861.83	484.69	235.19
Operating Cash Flow	EURO	-40999280.71	420500	1564300	475178	-5870.74	79447.57
EBIT	000 EURO	-44555.75	402.5	1481.3	141.78	-45.06	-29.32
Net Profit	EURO	-46707747.19	363500	154300	-31544	-48645.58	-50607.43
Return on investment	%	-79.34	31.59	78.13	0.84	-1.95	-2.07
Running cost to turnover ratio	%	176.91	85.82	84.56	99.4	105.69	95.48
EBIT to turnover ratio	%	-78.65	13.58	15.58	2.03	-2.7	-2.43
Labour productivity	000 €/FTE	-35.19	51.38	52.32	39.61	26.93	23.52
Capital productivity	%	-38.54	80.65	140.73	11.06	20.97	16.6
Financial Position	%	9.12	100	100	-1.4	-0.13	96.17
Future expectations of the industry	%	-0.09	0.01	-0.01	-0.04	0.02	-0.06

Year 2008 – part 2

Variable	unit	total	Seg. 5.2	Seg. 6.2	Seg. 7.2	Seg. 9.3
Turnover	000 EURO	95804.40	5925.30	156.15	14452.36	45430.38
Subsidies	000 EURO	389.83	0.00	10.00	134.51	11.74
Other income	EURO	4264499.40	55251.00	25209.00	691686.40	2355434.00
Total income	EURO	100458728.69	5980552.00	191354.00	15278560.49	47797553.20
Wages and salaries	EURO	15736758.63	919393.00	92845.00	4773466.63	5696921.00
Imputed value of unpaid labour	EURO	28636.63	0.00	0.00	23542.63	5094.00
Energy costs	EURO	14006731.78	670683.00	3151.00	4291423.47	6405934.94
Raw material costs: Feed costs	EURO	12901880.79	1706137.00	0.00	0.00	0.00
Raw material costs: Livestock costs	EURO	13309000.07	1403769.00	0.00	2503437.75	4693449.50
Repair and maintenance	EURO	7377764.59	175167.00	5861.00	850946.54	4917255.21
Other operational costs	EURO	7196146.84	510741.00	77296.00	1080921.82	2924979.10
Depreciation of capital	EURO	3750635.52	298432.00	9329.00	813964.52	697134.00
Financial costs, net	EURO	1818182.76	76043.00	2438.00	177405.76	607754.00
Extraordinary costs, net	EURO	815499.80	0.00	193.00	138423.00	102830.80
Total value of assets	EURO	130401383.14	21044666.00	116260.00	16894679.14	29381694.00
Net Investments	EURO	25712535.48	2120815.00	1006.50	4083427.50	10036142.92
Debt	EURO	69543858	1845465	100569	14623232	12721908
Raw material volume: Feed	TONNE	6786.89	1743.13	0.00	0.00	0.00
Raw material volume: Livestock	TONNE	12089.95	440.24	0.00	6.80	10240.00
Total sales volume	TONNE	32457.92	423.75	18.66	12015.61	14578.28
Male employees	NUMBER	1422	31		281	1041
Female employees	NUMBER	99	1		57	33
Total employees	NUMBER	1521	32		338	1074
Male FTE	NUMBER					
Female FTE	NUMBER					
FTE	NUMBER					
Number of enterprises <=5 employees	NUMBER					
Number of enterprises 6-10 employees	NUMBER					
Number of enterprises >10 employees	NUMBER					
Number of enterprises	NUMBER					
Employment per firm	EURO					
FTE per firm	EURO					
Mean wage	EURO	10365.15	28731.03		14192.34	5309.14
Total production costs	EURO	70556919.33	5385890.00	179153	13523738.84	24643633.75
Gross Added Value	000 EURO	45277.37	1514.06		6417.32	28844.20
Operating Cash Flow	EURO	29901809.36	594662.00		1754821.65	23153919.45
EBIT	000 EURO	26151.17	296.23		940.86	22456.79
Net Profit	EURO	24332991.08	220187.00		763451.37	21849031.45
Return on investment	%	20.05	1.41		5.57	76.43
Running cost to turnover ratio	%	73.65	90.9	114.73	93.57	54.24
EBIT to turnover ratio	%	27.3	5		6.51	49.43
Labour productivity	000 €/FTE	29.77	47.31		18.99	26.86
Capital productivity	%	34.72	7.19		37.98	98.17
Financial Position	%	46.67	91.23	13.50	13.44	56.70
Future expectations of the industry	%	-0.17	-0.09	0.07	-0.19	-0.32

Year 2009 – part 1

Variable	unit	total	Seg. 2.2	Seg. 2.3	Seg. 3.2	Seg. 3.3	Seg. 3.4
Turnover	000 EURO	95804.40	2249.62	8548.22	459.29	16267.12	2315.96
Subsidies	000 EURO	389.83	0.00	17.62	0.87	158.66	56.44
Other income	EURO	4264499.40	98109.00	61427.00	23013.00	706528.00	247842.00
Total income	EURO	100458728.69	2347730.00	8627267.00	483173.00	17132307.00	2620232.00
Wages and salaries	EURO	15736758.63	250364.00	1178810.00	329450.00	1667049.00	828460.00
Imputed value of unpaid labour	EURO	28636.63	0.00	0.00	0.00	0.00	0.00
Energy costs	EURO	14006731.78	115500.00	579495.77	24845.00	1655571.40	260127.20
Raw material costs: Feed costs	EURO	12901880.79	599000.00	3510634.95	110271.00	5896714.20	1079123.64
Raw material costs: Livestock costs	EURO	13309000.07	1058000.00	829626.52	33483.30	2275571.40	511662.60
Repair and maintenance	EURO	7377764.59	36500.00	107453.94	14453.00	1157039.00	113088.90
Other operational costs	EURO	7196146.84	59000.00	418681.92	233207.70	1620000.00	271319.30
Depreciation of capital	EURO	3750635.52	85838.00	311307.00	61106.00	1047182.00	426343.00
Financial costs, net	EURO	1818182.76	105079.00	97318.00	3454.00	696995.00	51696.00
Extraordinary costs, net	EURO	815499.80	50002.00	10021.00	1223.00	140814.00	371993.00
Total value of assets	EURO	130401383.14	3938075.00	14921035.00	786124.00	33286636.00	10032214.00
Net Investments	EURO	25712535.48	2582703.00	4988226.00	69350.56	127901.00	1702963.00
Debt	EURO	69543858	3533181	7388499	1130892	21168360	7031752
Raw material volume: Feed	TONNE	6786.89	585.00	3679.87	620.27	0.00	158.62
Raw material volume: Livestock	TONNE	12089.95	332.60	906.19	162.50	0.00	1.62
Total sales volume	TONNE	32457.92	546.00	3606.05	227.57	100.00	942.00
Male employees	NUMBER	1422	9	30	7		23
Female employees	NUMBER	99	1	3	1		3
Total employees	NUMBER	1521	10	33	8	0	26
Male FTE	NUMBER						
Female FTE	NUMBER						
FTE	NUMBER						
Number of enterprises <=5 employees	NUMBER						
Number of enterprises 6-10 employees	NUMBER						
Number of enterprises >10 employees	NUMBER						
Number of enterprises	NUMBER						
Employment per firm	EURO						
FTE per firm	EURO						
Mean wage	EURO	10365.15	25036.4	35721.52	41181.25		31863.85
Total production costs	EURO	70556919.33	2118364	6624703.1	745710	14271945	3063781.64
Gross Added Value	000 EURO	45277.37	479.73	3163.75	66.04	4368.76	328.48
Operating Cash Flow	EURO	29901809.36	229366	2002563.9	-262537	2860362	-443549.64
EBIT	000 EURO	26151.17	143.53	1691.26	-323.64	1813.18	-869.89
Net Profit	EURO	24332991.08	38449	1593938.9	-327097	1116185	-921588.64
Return on investment	%	20.05	3.64	11.33	-41.17	5.45	-8.67
Running cost to turnover ratio	%	73.65	94.17	77.5	162.36	87.73	132.29
EBIT to turnover ratio	%	27.3	6.38	19.78	-70.47	11.15	-37.56
Labour productivity	000 €/FTE	29.77	47.97	95.87	8.26		12.63
Capital productivity	%	34.72	12.18	21.2	8.4	13.12	3.27
Financial Position	%	46.67	10.28	50.48	-43.86	36.41	29.91
Future expectations of the industry	%	-0.17	-0.63	-0.31	-0.01	0.03	-0.13

Year 2009 – part 2

Variable	unit	total	Seg. 5.2	Seg. 6.2	Seg. 7.2	Seg. 9.3
Turnover	000 EURO	95804.40	5925.30	156.15	14452.36	45430.38
Subsidies	000 EURO	389.83	0.00	10.00	134.51	11.74
Other income	EURO	4264499.40	55251.00	25209.00	691686.40	2355434.00
Total income	EURO	100458728.69	5980552.00	191354.00	15278560.49	47797553.20
Wages and salaries	EURO	15736758.63	919393.00	92845.00	4773466.63	5696921.00
Imputed value of unpaid labour	EURO	28636.63	0.00	0.00	23542.63	5094.00
Energy costs	EURO	14006731.78	670683.00	3151.00	4291423.47	6405934.94
Raw material costs: Feed costs	EURO	12901880.79	1706137.00	0.00	0.00	0.00
Raw material costs: Livestock costs	EURO	13309000.07	1403769.00	0.00	2503437.75	4693449.50
Repair and maintenance	EURO	7377764.59	175167.00	5861.00	850946.54	4917255.21
Other operational costs	EURO	7196146.84	510741.00	77296.00	1080921.82	2924979.10
Depreciation of capital	EURO	3750635.52	298432.00	9329.00	813964.52	697134.00
Financial costs, net	EURO	1818182.76	76043.00	2438.00	177405.76	607754.00
Extraordinary costs, net	EURO	815499.80	0.00	193.00	138423.00	102830.80
Total value of assets	EURO	130401383.14	21044666.00	116260.00	16894679.14	29381694.00
Net Investments	EURO	25712535.48	2120815.00	1006.50	4083427.50	10036142.92
Debt	EURO	69543858	1845465	100569	14623232	12721908
Raw material volume: Feed	TONNE	6786.89	1743.13	0.00	0.00	0.00
Raw material volume: Livestock	TONNE	12089.95	440.24	0.00	6.80	10240.00
Total sales volume	TONNE	32457.92	423.75	18.66	12015.61	14578.28
Male employees	NUMBER	1422	31		281	1041
Female employees	NUMBER	99	1		57	33
Total employees	NUMBER	1521	32		338	1074
Male FTE	NUMBER					
Female FTE	NUMBER					
FTE	NUMBER					
Number of enterprises <=5 employees	NUMBER					
Number of enterprises 6-10 employees	NUMBER					
Number of enterprises >10 employees	NUMBER					
Number of enterprises	NUMBER					
Employment per firm	EURO					
FTE per firm	EURO					
Mean wage	EURO	10365.15	28731.03		14192.34	5309.14
Total production costs	EURO	70556919.33	5385890.00	179153	13523738.84	24643633.75
Gross Added Value	000 EURO	45277.37	1514.06		6417.32	28844.20
Operating Cash Flow	EURO	29901809.36	594662.00		1754821.65	23153919.45
EBIT	000 EURO	26151.17	296.23		940.86	22456.79
Net Profit	EURO	24332991.08	220187.00		763451.37	21849031.45
Return on investment	%	20.05	1.41		5.57	76.43
Running cost to turnover ratio	%	73.65	90.9	114.73	93.57	54.24
EBIT to turnover ratio	%	27.3	5		6.51	49.43
Labour productivity	000 €/FTE	29.77	47.31		18.99	26.86
Capital productivity	%	34.72	7.19		37.98	98.17
Financial Position	%	46.67	91.23	13.50	13.44	56.70
Future expectations of the industry	%	-0.17	-0.09	0.07	-0.19	-0.32

Year 2008 – part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 2.3 value	Seg. 2.3 weight	Seg. 3.2 value	Seg. 3.2 weight	Seg. 3.3 value	Seg. 3.3 weight	Seg. 3.4 value	Seg. 3.4 weight
Clam	18915611	5375.97										
Mussel	11865812	18983.76										
Other fresh water fish	3350000	284.6										
Other marine fish	170450	23										
Sea bass e sea bream	9872282	1290.67					6993559	808	1671223	230.6	1207500	252.07
Trout	12475000	5853	2965000	1512	9510000	4341						

Year 2008 – part 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 5.2 value	Seg. 5.2 weight	Seg. 6.2 value	Seg. 6.2 weight	Seg. 7.2 value	Seg. 7.2 weight	Seg. 9.3 value	Seg. 9.3 weight
Clam	18915611	5375.97							18915611	5375.97
Mussel	11865812	18983.76					11865812	18983.76		
Other fresh water fish	3350000	284.6	3350000	284.6						
Other marine fish	170450	23			170450	23				
Sea bass e sea bream	9872282	1290.67								
Trout	12475000	5853								

Year 2009 – part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 2.3 value	Seg. 2.3 weight	Seg. 3.2 value	Seg. 3.2 weight	Seg. 3.3 value	Seg. 3.3 weight	Seg. 3.4 value	Seg. 3.4 weight
Clam	45430380	14578										
Mussel	14452361	12016										
Other fresh water fish	5925301	424										
Other marine fish	156150	19										
Sea bass e sea bream	19042368	1270					459290	228	16267123	100	2315955	942
Trout	10797838	4152	2249621	546	8548217	3606						

Year 2009 – part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 5.2 value	Seg. 5.2 weight	Seg. 6.2 value	Seg. 6.2 weight	Seg. 7.2 value	Seg. 7.2 weight	Seg. 9.3 value	Seg. 9.3 weight
Clam	45430380	14578							45430380	14578
Mussel	14452361	12016					14452361	12016		
Other fresh water fish	5925301	424	5925301	424						
Other marine fish	156150	19			156150	19				
Sea bass e sea bream	19042368	1270								
Trout	10797838	4152								

Malta

Segment 6.4

Variable	unit	2008	2009
Turnover	000 EURO	89289.18	44003.82
Subsidies	000 EURO	117.22	89.29
Other income	EURO	0	210791
Total income	EURO	89406401	44303907
Wages and salaries	EURO	3391599	3031091
Imputed value of unpaid labour	EURO	0	0
Energy costs	EURO	2755674	1480911
Raw material costs: Feed costs	EURO	15634372	20580552
Raw material costs: Livestock costs	EURO	24796854	25745537
Repair and maintenance	EURO	4232177	4024892
Other operational costs	EURO	17612082	15094808
Depreciation of capital	EURO	8628791	10912812
Financial costs, net	EURO	1129290	7246119
Extraordinary costs, net	EURO	3294900	5326711
Total value of assets	EURO	17973480	17053355
Net Investments	EURO	3987893	741833
Debt	EURO	5292842	37258198
Raw material volume: Feed	TONNE	22700	34578
Raw material volume: Livestock	TONNE	2277	4408
Total sales volume	TONNE	5717	5135
Male employees	NUMBER	189	135
Female employees	NUMBER	8	3
Total employees	NUMBER	197	138
Male FTE	NUMBER	139	109
Female FTE	NUMBER	6	1
FTE	NUMBER	145	110
Number of enterprises <=5 employees	NUMBER	0	0
Number of enterprises 6-10 employees	NUMBER	1	1
Number of enterprises >10 employees	NUMBER	4	4
Number of enterprises	NUMBER	5	5
Employment per firm	EURO	39.40	27.60
FTE per firm	EURO	29	22
Mean wage	EURO	23390.34	27555.37
Total production costs	EURO	68422758	69957791
Gross Added Value	000 EURO	24258.02	-22712.09
Operating Cash Flow	EURO	20983643	-25653884
EBIT	000 EURO	12354.85	-36566.70
Net Profit	EURO	11225562	-43812815
Return on investment	%	68.74	-214.43
Running cost to turnover ratio	%	76.63	158.98
EBIT to turnover ratio	%	13.84	-83.10
Labour productivity	000 €/FTE	167.30	-206.47
Capital productivity	%	134.97	-133.18
Financial Position	%	70.55	-118.48
Future expectations of the industry	%	0.26	0.60

Year 2008

Species	Seg. 6.4 value	Seg. 6.4 weight
Bluefin tuna	87056694	5041
Sea bream	2232489	676

Year 2009

Species	Seg. 6.4 value	Seg. 6.4 weight
Amberjack	15994	3
Bluefin tuna	40330508	4021
Sea bream	3657320	1111

For Totals

variable	Unit	2008	2009
Number of enterprises	NUMBER	6	6
Total sales volume	TONNE	6700	6300
Turnover	000 EURO	94000	48000
FTE	NUMBER	169	145
Gross Added Value	000 EURO	25000	-22000
Earnings Before Interest and Tax	000 EURO	13000	-36000
Return of investments	%	65	-200
Subsidies	000 EURO	117	89
Labour productivity	000 €/FTE	150	-150
Capital productivity	%	135	-125

Due to confidentiality issues data has been rounded

Netherlands

Year 2008

Variable	unit	total	Seg. 7.3	Seg. 8.3
Turnover	000 EURO	71146.63	66000.00	5146.63
Subsidies	000 EURO	0	0	0
Other income	EURO	9030289.29	6880766.63	2149522.67
Total income	EURO	80177006.63	72880766.63	7296240
Wages and salaries	EURO	9146437.63	7364008.97	1782428.67
Imputed value of unpaid labour	EURO	0	0	0
Energy costs	EURO	3896299.01	3441481.01	454818.00
Raw material costs: Feed costs	EURO	0	0	0
Raw material costs: Livestock costs	EURO	9287057.57	9182986.23	104071.33
Repair and maintenance	EURO	4718768.54	4130936.54	587832.00
Other operational costs	EURO	7275312.37	6336178.37	939134.00
Depreciation of capital	EURO	4004618.00	3649316.67	355301.33
Financial costs, net	EURO	8768665.76	7353046.43	1415619.33
Extraordinary costs, net	EURO	740752.73	544169.40	196583.33
Total value of assets	EURO	223409606.92	207942145.59	15467461.33
Net Investments	EURO	8282706.01	8067325.34	215380.67
Debt	EURO	146174446.11	137271897.45	8902548.67
Raw material volume: Feed	TONNE	0	0	0
Raw material volume: Livestock	TONNE	0	0	0
Total sales volume	TONNE	46000	37000	
Male employees	NUMBER	255	170	85
Female employees	NUMBER	0	0	0
Total employees	NUMBER	255	170	85
Male FTE	NUMBER	255	170	85
Female FTE	NUMBER	0	0	0
FTE	NUMBER	255	170	85
Number of enterprises <=5 employees	NUMBER			
Number of enterprises 6-10 employees	NUMBER			
Number of enterprises >10 employees	NUMBER			
Number of enterprises	NUMBER			
Employment per firm	EURO			
FTE per firm	EURO			
Mean wage	EURO	35868.38	43317.70	20969.75
Total production costs	EURO	34323875.12	30455591.12	3868284.00
Gross Added Value	000 EURO	54999.57	49789.18	5210.38
Operating Cash Flow	EURO	45853131.51	42425175.51	3427956.00
EBIT	000 EURO	41848.51	38775.86	3072.65
Net Profit	EURO	33079847.75	31422812.41	1657035.34
Return on investment	%	18.73	18.65	19.87
Running cost to turnover ratio	%	48.24	46.14	75.16
EBIT to turnover ratio	%	58.82	58.75	59.70
Labour productivity	000 €/FTE	215.68	292.88	61.30
Capital productivity	%	24.62	23.94	33.69
Financial Position	%	34.57	33.99	42.44
Future expectations of the industry	%	-0.02	-0.02	0.01

Year 2009

Variable	unit	total	Seg. 7.3	Seg. 8.3
Turnover	000 EURO	62335.62	56000.00	6335.62
Subsidies	000 EURO	0	0	0
Other income	EURO	-2580135.05	-5229388.65	2649253.60
Total income	EURO	59755486.55	50770611.35	8984875.20
Wages and salaries	EURO	8731713.37	7959820.57	771892.80
Imputed value of unpaid labour	EURO	0	0	0
Energy costs	EURO	3630532.77	3296335.97	334196.80
Raw material costs: Feed costs	EURO	0	0	0
Raw material costs: Livestock costs	EURO	2879705.02	2821084.22	58620.80
Repair and maintenance	EURO	4198842.93	3452077.33	746765.60
Other operational costs	EURO	8773789.9	7933078.70	840711.20
Depreciation of capital	EURO	6741728.08	6393822.48	347905.60
Financial costs, net	EURO	17748041.62	16528736.82	1219304.80
Extraordinary costs, net	EURO	760595.83	760595.83	0.00
Total value of assets	EURO	195279032.66	179922550.26	15356482.40
Net Investments	EURO	11361526.95	11165448.55	196078.40
Debt	EURO	121019830.23	118734139.83	2285690.40
Raw material volume: Feed	TONNE	0	0	0
Raw material volume: Livestock	TONNE	0	0	0
Total sales volume	TONNE	46000	46000	
Male employees	NUMBER	255	170	85
Female employees	NUMBER	0	0	0
Total employees	NUMBER	255	170	85
Male FTE	NUMBER	255	170	85
Female FTE	NUMBER	0	0	0
FTE	NUMBER	255	170	85
Number of enterprises <=5 employees	NUMBER	0		
Number of enterprises 6-10 employees	NUMBER	0		
Number of enterprises >10 employees	NUMBER			
Number of enterprises	NUMBER			
Employment per firm	EURO			
FTE per firm	EURO			
Mean wage	EURO	34242.01	46822.47	9081.09
Total production costs	EURO	28214583.99	25462396.79	2752187.20
Gross Added Value	000 EURO	40272.62	33268.04	7004.58
Operating Cash Flow	EURO	31540902.56	25308214.56	6232688.00
EBIT	000 EURO	24799.17	18914.39	5884.78
Net Profit	EURO	7051132.86	2385655.26	4665477.60
Return on investment	%	12.70	10.51	38.32
Running cost to turnover ratio	%	45.26	45.47	43.44
EBIT to turnover ratio	%	39.78	33.78	92.88
Labour productivity	000 €/FTE	157.93	195.69	82.41
Capital productivity	%	20.62	18.49	45.61
Financial Position	%	38.03	34.01	85.12
Future expectations of the industry	%	-0.02	-0.03	0.01

Year 2008

Species	total turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 7.3 value	Seg. 7.3 weight	Seg. 8.3 value	Seg. 8.3 weight
Crassostrea gigas	4819938.12	20364000			4819938.12	20364000
Mytilus edulis	66000000	37000	66000000	37000		
Ostrea edulis	326695.22	430000			326695.22	430000

Year 2009

Species	total turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 7.3 value	Seg. 7.3 weight	Seg. 8.3 value	Seg. 8.3 weight
Crassostrea gigas	5304880.56	19304000			5304880.6	19304000
Mytilus edulis	50770611.35	46000	50770611	46000		
Ostrea edulis	1030741.04	1070000			1030741.04	1070000

Poland

Variable	unit	total
Turnover	000 EURO	2882.21
Subsidies	000 EURO	53.84
Other income	EURO	31657
Total income	EURO	2967704
Wages and salaries	EURO	472797
Imputed value of unpaid labour	EURO	63222
Energy costs	EURO	112304
Raw material costs: Feed costs	EURO	1150226
Raw material costs: Livestock costs	EURO	335446
Repair and maintenance	EURO	106941
Other operational costs	EURO	203808
Depreciation of capital	EURO	202098
Financial costs, net	EURO	66410
Extraordinary costs, net	EURO	0
Total value of assets	EURO	7584434
Net Investments	EURO	137027
Debt	EURO	1205518
Raw material volume: Feed	TONNE	1328
Raw material volume: Livestock	TONNE	148
Total sales volume	TONNE	1057
Male employees	NUMBER	46
Female employees	NUMBER	12
Total employees	NUMBER	58
Male FTE	NUMBER	43
Female FTE	NUMBER	10
FTE	NUMBER	53
Number of enterprises <=5 employees	NUMBER	4
Number of enterprises 6-10 employees	NUMBER	2
Number of enterprises >10 employees	NUMBER	1
Number of enterprises	NUMBER	7
Employment per firm	EURO	8.29
FTE per firm	EURO	7.57
Mean wage	EURO	10113.57
Total production costs	EURO	2444744
Gross Added Value	000 EURO	1005.14
Operating Cash Flow	EURO	522960
EBIT	000 EURO	320.86
Net Profit	EURO	254452
Return on investment	%	4.23
Running cost to turnover ratio	%	84.82
EBIT to turnover ratio	%	11.13
Labour productivity	000 €/FTE	18.96
Capital productivity	%	13.25
Financial Position	%	84.11
Future expectations of the industry	%	0.01

Year 2008

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 1.3 value	Seg. 1.3 weight	Seg. 2.3 value	Seg. 2.3 weight	Seg. 4.3 value	Seg. 4.3 weight	Seg. 5.3 value	Seg. 5.3 weight
Carp	45683494	18625					45683494	18625		
Other freshwater fish	21303038	5163.8							21303038	5163.8
Salmon	239771	11.1	239771	11.1						
Trout	41992625	19068.9			41992625	19068.9				

Year 2009

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 1.3 value	Seg. 1.3 weight	Seg. 2.3 value	Seg. 2.3 weight	Seg. 4.3 value	Seg. 4.3 weight	Seg. 5.3 value	Seg. 5.3 weight
Carp	39780039	19624.3					39780039	19624.3		
Other freshwater fish	17555273	4466.2							17555273	4466.2
Salmon	242074	13.8	242074	13.8						
Trout	30778422	14749.8			30778422	14749.8				

Portugal

Year 2008

Variable	unit	total	Seg. 2.2	Seg. 3.2	Seg. 3.4	Seg. 7.1	Seg. 8.3	Seg. 9.3	Seg. 10.3
Turnover	000 EURO	40993.71	1720.26	12313.37	1701.31	132.2	3495.68	18073.7	788.77
Subsidies	000 EURO	0	0	0	0	0	0	0	0
Other income	EURO	0	0	0	0	0	0	0	0
Total income	EURO	40993711	1720262	12313368	1701305	132196	3495681	18073700	788773
Wages and salaries	EURO								
Imputed value of unpaid labour	EURO	0	0	0	0	0	0	0	0
Energy costs	EURO	2007141	61597	1098326	32167	126000	18000	0	0
Raw material costs: Feed costs	EURO	6526141	968449	4192281	882732	0	0	0	0
Raw material costs: Livestock costs	EURO	777	0	777	0	0	0	0	0
Repair and maintenance	EURO								
Other operational costs	EURO	12208220	406419	6697572	683646	41000	78400	0	0
Depreciation of capital	EURO								
Financial costs, net	EURO	0	0	0	0	0	0	0	0
Extraordinary costs, net	EURO								
Total value of assets	EURO								
Net Investments	EURO								
Debt	EURO								
Raw material volume: Feed	TONNE	8242	1284	5396	1096	0	0	0	0
Raw material volume: Livestock	TONNE	96	0	0	0	0	0	0	0
Total sales volume	TONNE	6885	725	2187	455	250	755	2079	91
Male employees	NUMBER								
Female employees	NUMBER								
Total employees	NUMBER	2347	44	213	12	42	122	1776	67
Male FTE	NUMBER								
Female FTE	NUMBER								
FTE	NUMBER								
Number of enterprises <=5 employees	NUMBER	1446	9	65	3	14	62	1244	43
Number of enterprises 6-10 employees	NUMBER	11	1	3	0	0	2	3	0
Number of enterprises >10 employees	NUMBER	6	1	2	0	0	0	0	0
Number of enterprises	NUMBER	1463	11	70	3	14	64	1247	43
Employment per firm	EURO	1.60	4.00	3.04	4.00	3.00	1.91	1.42	1.56
FTE per firm	EURO								
Mean wage	EURO								
Total production costs	EURO	20742279	1436465	11988956	1598545	167000	96400		
Gross Added Value	000 EURO	20251.43	283.80	324.41	102.76	-34.80	3399.28		
Operating Cash Flow	EURO								
EBIT	000 EURO								
Net Profit	EURO								
Return on investment	%								
Running cost to turnover ratio	%	50.60	83.50	97.37	93.96	126.33	2.76		
EBIT to turnover ratio	%								
Labour productivity	000 €/FTE	8.63	6.45	1.52	8.56	-0.83	27.86		
Capital productivity	%								
Financial Position	%								
Future expectations of the industry	%								

Year 2009 pat 1

Variable	unit	total	Seg. 2.2	Seg. 3.2	Seg. 3.4	Seg. 5.2
Turnover	000 EURO	37249.61	1151.05	8279.68	1606.16	0.39
Subsidies	000 EURO	0	0	0	0	0
Other income	EURO	0	0	0	0	0
Total income	EURO	37249605	1151051	8279684	1606155	390
Wages and salaries	EURO	8993333	296115	2515392	37870	50198
Imputed value of unpaid labour	EURO	0	0	0	0	0
Energy costs	EURO	4042097	182673	1681712	42470	101998
Raw material costs: Feed costs	EURO	6642006	936371	2939292	1248806	0
Raw material costs: Livestock costs	EURO	18883	0	9383	0	0
Repair and maintenance	EURO	3140936	79641	1442508	989	16377
Other operational costs	EURO	7068233	79646	1373160	416906	2854
Depreciation of capital	EURO	430895	0	346136	0	0
Financial costs, net	EURO	96727	0	89192	7525	0
Extraordinary costs, net	EURO	721405	0	163872	0	0
Total value of assets	EURO	188262192	0	9956723	89990	0
Net Investments	EURO	172148822	393742	3868036	0	56249
Debt	EURO	79906743	0	6222508	0	0
Raw material volume: Feed	TONNE	7616	1241	3659	1336	0
Raw material volume: Livestock	TONNE	145	0	0	0	0
Total sales volume	TONNE	6208	518	1490	448	0.03
Male employees	NUMBER	2024	29	184	6	5
Female employees	NUMBER	282	3	28	1	0
Total employees	NUMBER	2306	32	212	7	5
Male FTE	NUMBER	1085	27	180	4	5
Female FTE	NUMBER	142	3	22	0	0
FTE	NUMBER	1227	30	202	4	5
Number of enterprises <=5 employees	NUMBER	1443	9	58	3	3
Number of enterprises 6-10 employees	NUMBER	7	0	3	0	0
Number of enterprises >10 employees	NUMBER	4	0	2	0	0
Number of enterprises	NUMBER	1454	9	63	3	3
Employment per firm	EURO	1.59	3.56	3.37	2.33	1.67
FTE per firm	EURO	0.84	3.33	3.21	1.33	1.67
Mean wage	EURO	7329.53	9870.50	12452.44	9467.50	10039.60
Total production costs	EURO	29905488	1574446	9961447	1747041	171427
Gross Added Value	000 EURO	16337.45	-127.28	833.63	-103.02	
Operating Cash Flow	EURO	7344117	-423395	-1681763	-140886	
EBIT	000 EURO	6913.22		-2027.90		
Net Profit	EURO	6816495		-2117091		
Return on investment	%	3.67		-20.37		
Running cost to turnover ratio	%	80.28	136.78	120.31	108.77	43955.64
EBIT to turnover ratio	%	18.56		-24.49		
Labour productivity	000 €/FTE	13.31	-4.24	4.13	-25.75	
Capital productivity	%	8.68		8.37	-114.47	
Financial Position	%	57.56		37.50		
Future expectations of the industry	%	-0.91		-0.35		

Year 2009 – part 2

Variable	unit	total	Seg. 7.1	Seg. 8.4	Seg. 9.3	Seg. 10.4
Turnover	000 EURO	37249.61	441.90	1584.53	20366.69	483.86
Subsidies	000 EURO	0	0	0	0	0
Other income	EURO	0	0	0	0	0
Total income	EURO	37249605	441896	1584533	20366688	483863
Wages and salaries	EURO	8993333	332908	365777	4175638	75319
Imputed value of unpaid labour	EURO	0	0	0	0	0
Energy costs	EURO	4042097	198765	115330	710121	10161
Raw material costs: Feed costs	EURO	6642006	0	288714	0	0
Raw material costs: Livestock costs	EURO	18883	0	0	0	0
Repair and maintenance	EURO	3140936	5050	53449	597428	9739
Other operational costs	EURO	7068233	52712	20438	366167	26185
Depreciation of capital	EURO	430895	80538	0	0	0
Financial costs, net	EURO	96727	0	0	0	0
Extraordinary costs, net	EURO	721405	4793	0	0	0
Total value of assets	EURO	188262192	0	0	0	0
Net Investments	EURO	172148822	953398	112498	0	0
Debt	EURO	79906743	545546	0	0	0
Raw material volume: Feed	TONNE	7616	0	318	0	0
Raw material volume: Livestock	TONNE	145	0	0	0	0
Total sales volume	TONNE	6208	441	594	2175	105
Male employees	NUMBER	2024	33	84	1599	26
Female employees	NUMBER	282	7	9	221	4
Total employees	NUMBER	2306	40	93	1820	30
Male FTE	NUMBER	1085	23	52	725	12
Female FTE	NUMBER	142	4	5	98	2
FTE	NUMBER	1227	27	57	823	14
Number of enterprises <=5 employees	NUMBER	1443	16	54	1271	20
Number of enterprises 6-10 employees	NUMBER	7	1	0	3	0
Number of enterprises >10 employees	NUMBER	4	0	0	0	0
Number of enterprises	NUMBER	1454	17	54	1274	20
Employment per firm	EURO	1.59	2.35	1.72	1.43	1.5
FTE per firm	EURO	0.84	1.59	1.06	0.65	0.7
Mean wage	EURO	7329.53	12329.93	6417.14	5073.68	5379.93
Total production costs	EURO	29905488	589435	843708	5849354	121404
Gross Added Value	000 EURO	16337.45	185.37	1106.60	18692.97	437.78
Operating Cash Flow	EURO	7344117	-147539	740825	14517334	362459
EBIT	000 EURO	6913.22	-228.08			
Net Profit	EURO	6816495	-228077			
Return on investment	%	3.67				
Running cost to turnover ratio	%	80.28	133.39	53.25	28.72	25.09
EBIT to turnover ratio	%	18.56	-51.61			
Labour productivity	000 €/FTE	13.31	6.87	19.41	22.71	31.27
Capital productivity	%	8.68				
Financial Position	%	57.56				
Future expectations of the industry	%	-0.91				

Year 2008 part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 3.2 value	Seg. 3.2 weight	Seg. 3.4 value	Seg. 3.4 weight	Seg. 6.2 value	Seg. 6.2 weight
Anguilla anguilla	1609	0			169					
Argyrosomus regius	177235	19			6282	9			114434	1
Cerastoderma edule	12000	20								
Crassostrea gigas	460800	256								
Crassostrea spp	1960095	392			2295	4				
Dicentrarchus labrax	6856644	1139			683638	1134			266	5
Diplodus sargus	4498	1			4498	1				
Diplodus spp	1248	0			1248					
Mugil spp	440	0			325				115	
Mytilus spp	120196	230								
Oncorhynchus mykiss	1681853	714	1681853	714						
Osteichthyes	70	0			5				2	
Pagellus bogaraveo	98000	25					98	25		
Palaemonetes varians	2125	1			2125	1				
Psetta maxima	2085812	297							285812	297
Ruditapes decussatus	19959354	2281								
Salmo trutta	38409	11	3849	11						
Sepia officinalis	270	0							27	
Solea solea	171828	13			71761	5			167	8
Sparus aurata	6914688	1462			537622	132	16335	43	376	
Thunnus thynnus	437943	22							437943	22
Venerupis pullastra	1300	0			13					

Year 2008 – part 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 7.1 value	Seg. 7.1 weight	Seg. 8.3 value	Seg. 8.3 weight	Seg. 9.3 value	Seg. 9.3 weight	Seg. 10.3 value	Seg. 10.3 weight
Anguilla anguilla	1609	0								
Argyrosomus regius	177235	19								
Cerastoderma edule	12000	20	12	2						
Crassostrea gigas	460800	256			468	256				
Crassostrea spp	1960095	392			1779	354	15755	32	955	2
Dicentrarchus labrax	6856644	1139								
Diplodus sargus	4498	1								
Diplodus spp	1248	0								
Mugil spp	440	0								
Mytilus spp	120196	230	12196	23						
Oncorhynchus mykiss	1681853	714								
Osteichthyes	70	0								
Pagellus bogaraveo	98000	25								
Palaemonetes varians	2125	1								
Psetta maxima	2085812	297								
Ruditapes decussatus	19959354	2281			1263981	144	1791615	248	779223	89
Salmo trutta	38409	11								
Sepia officinalis	270	0								
Solea solea	171828	13								
Sparus aurata	6914688	1462								
Thunnus thynnus	437943	22								
Venerupis pullastra	1300	0								

Year 2009 – part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 3.2 value	Seg. 3.2 weight	Seg. 3.4 value	Seg. 3.4 weight	Seg. 5.2 value	Seg. 5.2 weight	Seg. 6.2 value	Seg. 6.2 weight
Atlantic bluefin tuna	715885	40									715885	4
Common cuttlefish	60	0									6	
Common edible cockle	39624	65										
Common sole	194188	15			789	6					12499	9
Cupped oysters nei	341352	480										
European eel	3929	1			3539	1			39			
European flat oyster	2280	1										
European seabass	3479524	539			3461448	536					1876	3
Flathead grey mullet	104	0			14							
Gilthead seabream	6056591	1325			445436	877	166155	448				
Grooved carpet shell	22054721	2329										
Marine fishes nei	477	0			477							
Meagre	374014	78			286127	69					87888	9
Pacific cupped oyster	292484	162										
Pullet carpet shell	2390	0			239							
Rainbow trout	1126064	514	112664	514								
Sea trout	24987	4	24987	4								
Turbot	2389316	376									2389316	376
White seabream	4512	1			4512	1						
Mytilus mussels nei	146520	278										
Mugilidae	584	0			562						22	

Year 2009 – part 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 6.2 value	Seg. 6.2 weight	Seg. 7.1 value	Seg. 7.1 weight	Seg. 8.3 value	Seg. 8.3 weight	Seg. 9.3 value	Seg. 9.3 weight	Seg. 10.3 value	Seg. 10.3 weight
Atlantic bluefin tuna	715885	40	715885	4								
Common cuttlefish	60	0	6									
Common edible cockle	39624	65					5196	9			34428	56
Common sole	194188	15	12499	9								
Cupped oysters nei	341352	480			612		321257	452	18868	27	614	1
European eel	3929	1										
European flat oyster	2280	1			228	1						
European seabass	3479524	539	1876	3								
Flathead grey mullet	104	0										
Gilthead seabream	6056591	1325										
Grooved carpet shell	22054721	2329					12588	133	234782	2149	448821	47
Marine fishes nei	477	0										
Meagre	374014	78	87888	9								
Pacific cupped oyster	292484	162			292484	162						
Pullet carpet shell	2390	0										
Rainbow trout	1126064	514										
Sea trout	24987	4										
Turbot	2389316	376	2389316	376								
White seabream	4512	1										
Mytilus mussels nei	146520	278			14652	278						
Mugilidae	584	0	22									

Romania

Year 2009

Variable	unit	total	Seg. 2.2	Seg. 2.3	Seg. 4.2	Seg. 4.3
Turnover	000 EURO	13896.49	826.69	764.53	4248.50	7990.54
Subsidies	000 EURO	0	0	0	0	0
Other income	EURO	38843597	628429	644669	30084970	6672043
Total income	EURO	52740082	1455118	1409199	34333470	14662581
Wages and salaries	EURO	7470945	172835	288003	2328781	4623340
Imputed value of unpaid labour	EURO	997824	19016	13020	687336	278452
Energy costs	EURO	3236036	20475	51499	2450796	700258
Raw material costs: Feed costs	EURO	4714830	522874	276839	1048051	2837080
Raw material costs: Livestock costs	EURO	4572240	96995	104656	2693176	1607933
Repair and maintenance	EURO	5630194	59907	54352	5244547	263554
Other operational costs	EURO	9519845	106525	103837	1210337	7990538
Depreciation of capital	EURO	2835203	83716	72244	1156958	1517252
Financial costs, net	EURO	414861	0	708	233825	180328
Extraordinary costs, net	EURO	1319429	0	25887	0	1293542
Total value of assets	EURO	175825363	2296067	2979785	102626982	64987433
Net Investments	EURO	15877468	32389	25992	10726546	3702585
Debt	EURO	49511230	177029	28701	38220132	8954545
Raw material volume: Feed	TONNE	10979	302	224	4066	6373
Raw material volume: Livestock	TONNE	3383.94	27	5.94	1721	1610
Total sales volume	TONNE	7292	262	176	2521	4322
Male employees	NUMBER	2135	22	50	1053	993
Female employees	NUMBER	534	12	16	135	347
Total employees	NUMBER	2669	34	66	1188	1340
Male FTE	NUMBER	2065	22	50	1027	949
Female FTE	NUMBER	477	12	16	89	338
FTE	NUMBER	2542	34	66	1116	1287
Number of enterprises <=5 employees	NUMBER	170	11	14	104	40
Number of enterprises 6-10 employees	NUMBER	79	1	3	56	15
Number of enterprises >10 employees	NUMBER	66	0	1	26	39
Number of enterprises	NUMBER	315	12	18	186	94
Employment per firm	EURO	8.47	2.83	3.67	6.39	14.26
FTE per firm	EURO	8.07	2.83	3.67	6.00	13.69
Mean wage	EURO	3331.54	5642.68	4560.95	2702.61	3808.70
Total production costs	EURO	36141914	998627	892206	15663024	18301155
Gross Added Value	000 EURO	25066.94	648.34	818.02	21686.56	1263.22
Operating Cash Flow	EURO	16598168	456491	516993	18670446	-3638574
EBIT	000 EURO	13762.97	372.78	444.75	17513.49	-5155.83
Net Profit	EURO	13348104	372775	444041	17279663	-5336154
Return on investment	%	7.83	16.24	14.93	17.07	-7.93
Running cost to turnover ratio	%	260.08	120.8	116.7	368.67	229.04
EBIT to turnover ratio	%	99.04	45.09	58.17	412.23	-64.52
Labour productivity	000 €/FTE	9.86	19.07	12.39	19.43	0.98
Capital productivity	%	14.26	28.24	27.45	21.13	1.94
Financial Position	%	71.84	92.29	99.04	62.76	86.22
Future expectations of the industry	%	-0.07	0.02	0.02	-0.09	-0.03

Year 2009 - part 1

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.2 value	Seg. 2.2 weight	Seg. 2.3 value	Seg. 2.3 weight	Seg. 4.2 value	Seg. 4.2 weight	Seg. 4.3 value	Seg. 4.3 weight
Carp	12235831	6843					4248500	2521	7987331	4322
Crayfish	3207	1								
Oyster and Mussels	66228	11								
Trout	1591219	438	826689	262	764530	176				

Year 2009 – part 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 7.2 value	Seg. 7.2 weight	Seg. 10.4 value	Seg. 10.4 weight
Carp	12235831	6843				
Crayfish	3207	1			3207	1
Oyster and Mussels	66228	11	2627	2		
Trout	1591219	438				

Slovenia

Year 2008

Variable	unit	total	Seg. 7.1
Turnover	000 EURO	519.26	128.61
Subsidies	000 EURO	0	0
Other income	EURO	2240146.13	1057090.13
Total income	EURO	2759409	1185703
Wages and salaries	EURO	566860.60	269441.60
Imputed value of unpaid labour	EURO	0	0
Energy costs	EURO	82595.05	36919.46
Raw material costs: Feed costs	EURO	246576.600	0.000
Raw material costs: Livestock costs	EURO	60989.46	13729.56
Repair and maintenance	EURO	57436.09	36219.30
Other operational costs	EURO	49726.40	28865.86
Depreciation of capital	EURO	111245	38109
Financial costs, net	EURO	72828	22826
Extraordinary costs, net	EURO	68764	67272
Total value of assets	EURO	3177028	831174
Net Investments	EURO	67469	67469
Debt	EURO	2511973	646379
Raw material volume: Feed	TONNE	218.50	0.00
Raw material volume: Livestock	TONNE	149.30	0.00
Total sales volume	TONNE	294.78	244.78
Male employees	NUMBER	27	18
Female employees	NUMBER	2	0
Total employees	NUMBER	29	18
Male FTE	NUMBER	24.35	15.95
Female FTE	NUMBER	2	0
FTE	NUMBER	26.35	15.95
Number of enterprises <=5 employees	NUMBER	10	9
Number of enterprises 6-10 employees	NUMBER	1	0
Number of enterprises >10 employees	NUMBER	0	0
Number of enterprises	NUMBER	11	9
Employment per firm	EURO	2.64	2.00
FTE per firm	EURO	2.40	1.77
Mean wage	EURO	21512.74	16892.89
Total production costs	EURO	1064184.20	385175.78
Gross Added Value	000 EURO	2262.09	1069.97
Operating Cash Flow	EURO	1695224.80	800527.22
EBIT	000 EURO	1583.98	762.42
Net Profit	EURO	1511151.80	739592.22
Return on investment	%	49.86	91.73
Running cost to turnover ratio	%	204.94	299.48
EBIT to turnover ratio	%	305.04	592.80
Labour productivity	000 €/FTE	85.85	67.08
Capital productivity	%	71.20	128.73
Financial Position	%	20.93	22.23
Future expectations of the industry	%	0.01	-0.04

Year 2009

Variable	unit	total	Seg. 7.1
Turnover	000 EURO	710.76	219.44
Subsidies	000 EURO	0	0
Other income	EURO	1890875	1160881
Total income	EURO	2601630.30	1380318.30
Wages and salaries	EURO	632256.70	273777.70
Imputed value of unpaid labour	EURO	0	0
Energy costs	EURO	81564.63	44500.96
Raw material costs: Feed costs	EURO	201395	0
Raw material costs: Livestock costs	EURO	94229.90	8770.00
Repair and maintenance	EURO	59736.25	42297.07
Other operational costs	EURO	46712.18	28559.90
Depreciation of capital	EURO	106428	41522
Financial costs, net	EURO	57938	17722
Extraordinary costs, net	EURO	87549	83377
Total value of assets	EURO	3058152	878399
Net Investments	EURO	32763.42	21200.92
Debt	EURO	2482241	709260
Raw material volume: Feed	TONNE	178.30	0
Raw material volume: Livestock	TONNE	229.93	0
Total sales volume	TONNE	380.11	315.21
Male employees	NUMBER	33	18
Female employees	NUMBER	2	0
Total employees	NUMBER	35	18
Male FTE	NUMBER	30.50	16.05
Female FTE	NUMBER	2	0
FTE	NUMBER	32.05	16.05
Number of enterprises <=5 employees	NUMBER	10	9
Number of enterprises 6-10 employees	NUMBER	0	0
Number of enterprises >10 employees	NUMBER	1	0
Number of enterprises	NUMBER	11	9
Employment per firm	EURO	3.18	2.00
FTE per firm	EURO	2.91	1.78
Mean wage	EURO	19727.20	17057.80
Total production costs	EURO	1115894.66	397905.63
Gross Added Value	000 EURO	2117.99	1256.19
Operating Cash Flow	EURO	1485735.64	982412.67
EBIT	000 EURO	1379.31	940.89
Net Profit	EURO	1321369.64	923168.67
Return on investment	%	45.10	107.11
Running cost to turnover ratio	%	157.00	181.33
EBIT to turnover ratio	%	194.06	428.77
Labour productivity	000 €/FTE	66.08	78.27
Capital productivity	%	69.26	143.01
Financial Position	%	18.83	19.26
Future expectations of the industry	%	0.02	0.02

Year 2008

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 3.4. value	Seg. 3.4. weight	Seg. 7.1 value	Seg. 7.1 weight
European seabass	378500	50	378500	50		
Mediterranean mussel	137707.87	244.78			137707.87	244.78

Year 2009

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 3.4 value	Seg. 3.4 weight	Seg. 7.1 value	Seg. 7.1 weight
European seabass	489403	64.65	489403	64.9		
Mediterranean mussel	173759	311.75			173759	311.75
Noah's ark	8825	0.83			8825	0.83
Sharpsnout seabream	1385	0.25	1385	0.25		
Warty venus	37383.3	2.63			37383.3	2.63

Spain

Year 2008 – part 1 of 4

Variable	unit	total	seg. 2.1	seg. 2.2	seg. 2.3	seg. 3.1	seg. 3.2
Turnover	000 EURO	462605.45	0	23256.09	37844.45	11535.17	12246.79
Subsidies	000 EURO	11432.17	73.90	499.78	192.18	170.59	309.93
Other income	EURO	21747277.27	85732.90	328173.69	673971.42	998982.17	76580.00
Total income	EURO	495784897.29	159630.88	24084048.91	38710605.98	12704738.39	12633303.04
Wages and salaries	EURO	97390329.52	30736.46	4088584.54	9348373.21	3330702.28	4911004.71
Imputed value of unpaid labour	EURO	67926118.34	7255.20	98433.13	468172.56	0	155037.03
Energy costs	EURO	13286494.91	0	297179.55	606344.05	0	1023310.87
Raw material costs: Feed costs	EURO	96841368.54	0	7783480.06	11440013.01	1763474.71	6580765.23
Raw material costs: Livestock costs	EURO	152882205.74	0	4628068.51	5368135.27	2478038.56	2466007.43
Repair and maintenance	EURO	13626316.62	0	515018.53	901526.57	280913.95	446049.57
Other operational costs	EURO	106907275.18	15877.62	5945464.95	7636877.35	4305098.51	3814130.93
Depreciation of capital	EURO	12658162.43	104174.24	242941.25	311162.74	687877.07	438302.76
Financial costs, net	EURO	-23711615.04	-2500.92	-403926.15	-660829.08	-162403.95	-834090.80
Extraordinary costs, net	EURO	15356471.18	0	340561.87	5003033.63	40.12	501907.03
Total value of assets	EURO	958508292.32	2239038.64	142856588.05	39511166.26	13522638.60	38452028.00
Net Investments	EURO	42408590.82	0.00	10062562.68	1282191.96	0.00	17923.00
Debt	EURO	84758222.520	0.000	5166671.810	11123617.110	0.000	874613.430
Raw material volume: Feed	TONNE	154207.06		12351.25	13702.54	1220.57	8167.93
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE						
Male employees	NUMBER	18344	46	182	357	76	183
Female employees	NUMBER	7978	0	78	99	35	39
Total employees	NUMBER	26322	46	260	456	111	222
Male FTE	NUMBER	5124	42	166	296	75	168
Female FTE	NUMBER	1488	0	73	75	33	25
FTE	NUMBER	6612	42	239	371	108	193
Number of enterprises <=5 employees	NUMBER	2028	8	12	43		7
Number of enterprises 6-10 employees	NUMBER	714	3	6	7		3
Number of enterprises >10 employees	NUMBER	359	1	7	10	4	5
Number of enterprises	NUMBER	3101	12	25	60	4	15
Employment per firm	EURO	8.49	3.83	10.40	7.60	27.75	14.80
FTE per firm	EURO	2.13	3.50	9.56	6.18	27.00	12.87
Mean wage	EURO	25002.49	904.56	17518.90	26459.69	30839.84	26248.92
Total production costs	EURO	548860108.9	53869.28	23356229.27	35769442.02	12158228.01	19396305.77
Gross Added Value	000 EURO	100809.06		4415.05	12565.53		-2006.89
Operating Cash Flow	EURO	-53075211.56		727819.64	2941163.96		-6763002.73
EBIT	000 EURO	-65733.37		484.88	2630.00		-7201.31
Net Profit	EURO	-42021758.95		888804.54	3290830.30		-6367214.69
Return on investment	%	-6.86		0.34	6.66		-18.73
Running cost to turnover ratio	%	118.65		100.43	94.52	105.40	158.38
EBIT to turnover ratio	%	-14.21		2.08	6.95		-58.80
Labour productivity	000 €/FTE	15.25		18.47	33.87		-10.40
Capital productivity	%	10.52		3.09	31.80		-5.22
Financial Position	%	91.16		96.38	71.85		97.73
Future expectations of the industry	%	-0.03	0.05	-0.07	-0.02	0.05	0.01

Year 2008 part 2 of 4

Variable	unit	total	seg. 3.3	seg. 3.4	seg. 4.3	seg. 5.2	seg. 5.3
Turnover	000 EURO	462605.45	27440.50	91033.20	617.74	210.00	11511.15
Subsidies	000 EURO	11432.17	378.27	4222.40	0.00	0.00	338.43
Other income	EURO	21747277.27	1015986.96	10169444.00	179214.20	0.00	2674415.85
Total income	EURO	495784897.29	28834748.16	105425045.40	796950.64	210000.00	14523997.27
Wages and salaries	EURO	97390329.52	6668854.35	22731017.83	519703.80	33600.00	4142049.70
Imputed value of unpaid labour	EURO	67926118.34	715138.51	269071.62	34493.89	0.00	0.00
Energy costs	EURO	13286494.91	2927983.44	1194567.19	187978.23	15000.00	8943.95
Raw material costs: Feed costs	EURO	96841368.54	4642104.86	44393785.77	263798.46	12000.00	5027607.10
Raw material costs: Livestock costs	EURO	152882205.74	2105861.85	41820972.22	95843.00	0.00	676050.37
Repair and maintenance	EURO	13626316.62	968160.62	3117701.82	179787.01	90000.00	295295.87
Other operational costs	EURO	106907275.18	8405079.07	23894862.31	267316.67	17400.00	2602661.22
Depreciation of capital	EURO	12658162.43	1497760.45	3545243.68	0.00		2000853.92
Financial costs, net	EURO	-23711615.04	-855571.45	-5904660.57	-66398.20	0.00	-1016215.65
Extraordinary costs, net	EURO	15356471.18	-98175.48	1155327.50	19137.80	0.00	-70001.33
Total value of assets	EURO	958508292.32	9803675.54	161889819.53	9014098.02	0.00	28915341.45
Net Investments	EURO	42408590.82	736309.33	5713660.68	112200.00	0.00	971614.58
Debt	EURO	84758222.52	7599224.36	3919543.40	789525.00	0.00	17752843.95
Raw material volume: Feed	TONNE	154207.06	2525.02	87571.75	210.31	274.67	4321.31
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE						
Male employees	NUMBER	18344	169	1235	145	12	131
Female employees	NUMBER	7978	70	159	10	0	3
Total employees	NUMBER	26322	239	1394	155	12	134
Male FTE	NUMBER	5124	168	783	74	12	63
Female FTE	NUMBER	1488	56	113	8	0	3
FTE	NUMBER	6612	224	896	82	12	66
Number of enterprises <=5 employees	NUMBER	2028		24	58	3	2
Number of enterprises 6-10 employees	NUMBER	714	1	7	1		1
Number of enterprises >10 employees	NUMBER	359	7	28	2		2
Number of enterprises	NUMBER	3101	8	59	61	3	5
Employment per firm	EURO	8.49	29.88	23.63	2.54	4.00	26.80
FTE per firm	EURO	2.13	28.00	15.19	1.34	4.00	13.20
Mean wage	EURO	25002.49	32964.25	25669.74	6758.51	2800.00	62758.33
Total production costs	EURO	548860108.85	26433182.70	137421978.76	1548921.06	168000.00	12752608.21
Gross Added Value	000 EURO	100809.06	9407.29	-13219.24	-197.77	75.60	5575.01
Operating Cash Flow	EURO	-53075211.56	2401565.46	-31996933.36	-751970.42	42000.00	1771389.06
EBIT	000 EURO	-65733.37	903.81	-35542.18			-229.46
Net Profit	EURO	-42021758.95	1759376.46	-29637516.47			786750.79
Return on investment	%	-6.86	9.22	-21.95			-0.79
Running cost to turnover ratio	%	118.65	96.33	150.96	250.74	80.00	110.78
EBIT to turnover ratio	%	-14.21	3.29	-39.04			-1.99
Labour productivity	000 €/FTE	15.25	42.00	-14.75	-2.41	6.30	84.47
Capital productivity	%	10.52	95.96	-8.17	-2.19		19.28
Financial Position	%	91.16	22.49	97.58	91.24		38.60
Future expectations of the industry	%	-0.03	0.08	-0.01	-0.01		0.04

Year 2008 part 3 of 4

Variable	unit	total	seg. 6.2	seg. 6.3	seg. 6.4	seg. 7.1	seg. 8.1
Turnover	000 EURO	462605.45	25742.92	28554.30	68475.69	90033.18	6107.89
Subsidies	000 EURO	11432.17	119.24	1597.26	15.05	523.05	10.88
Other income	EURO	21747277.27	540403.34	153804.77	121196.57	3407920.19	3756.17
Total income	EURO	495784897.29	26402562.15	30305367.79	68611940.49	93964148.25	6122532.00
Wages and salaries	EURO	97390329.52	4359893.40	10032307.39	4612641.75	12443699.25	331051.77
Imputed value of unpaid labour	EURO	67926118.34	704.76	0.00	181830.12	56560385.55	1727487.13
Energy costs	EURO	13286494.91	471110.99	1152803.18	1213965.11	3262712.11	48965.28
Raw material costs: Feed costs	EURO	96841368.54	576228.37	5090292.59	8778572.31	0.00	0.00
Raw material costs: Livestock costs	EURO	152882205.74	7760523.87	12889422.25	15077606.43	41454223.94	3198240.36
Repair and maintenance	EURO	13626316.62	901190.28	1296576.52	1053430.87	2545399.54	208944.69
Other operational costs	EURO	106907275.18	7106268.39	6555967.37	14171924.53	13803631.27	1711800.75
Depreciation of capital	EURO	12658162.43	0.00	930424.99	1430526.26	976935.38	63495.81
Financial costs, net	EURO	-23711615.04	-4840530.43	-3403264.64	-2073906.51	-2838283.59	-12246.56
Extraordinary costs, net	EURO	15356471.18	1364046.46	4609355.31	268859.91	2179076.83	2557.07
Total value of assets	EURO	958508292.32	115750289.67	191242047.36	67455287.47	85343374.35	29817732.53
Net Investments	EURO	42408590.82	40795.53	84588.00	13998604.14	7170365.17	154698.29
Debt	EURO	84758222.52	7486140.68	6771317.58	1219242.00	9094974.62	11002397.60
Raw material volume: Feed	TONNE	154207.06	4447.72	5110.57	13855.67		
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE						
Male employees	NUMBER	18344	178	270	136	10328	573
Female employees	NUMBER	7978	46	99	17	2423	328
Total employees	NUMBER	26322	224	369	153	12751	901
Male FTE	NUMBER	5124	152	262	86	1862	68
Female FTE	NUMBER	1488	44	97	12	488	24
FTE	NUMBER	6612	196	359	98	2350	92
Number of enterprises <=5 employees	NUMBER	2028	9			1400	33
Number of enterprises 6-10 employees	NUMBER	714	2	1	1	486	12
Number of enterprises >10 employees	NUMBER	359	5	6	5	168	16
Number of enterprises	NUMBER	3101	16	7	6	2054	61
Employment per firm	EURO	8.49	14.00	52.71	25.50	6.21	14.77
FTE per firm	EURO	2.13	12.25	51.29	16.33	1.14	1.51
Mean wage	EURO	25002.49	22247.95	27945.15	48923.18	29363.44	22375.42
Total production costs	EURO	548860108.85	21175920.06	37017369.30	45089971.12	130070051.66	7226489.98
Gross Added Value	000 EURO	100809.06	9468.00	1723.04	28301.39	32375.13	943.70
Operating Cash Flow	EURO	-53075211.56	5226642.09	-6712001.51	23521969.37	-36105903.41	-1103957.98
EBIT	000 EURO	-65733.37		-7642.43	22091.44	-37082.84	-1167.45
Net Profit	EURO	-42021758.95		-4239161.86	24165349.62	-34244555.20	-1155207.23
Return on investment	%	-6.86		-4.00	32.75	-43.45	-3.92
Running cost to turnover ratio	%	118.65	82.26	129.64	65.85	144.47	118.31
EBIT to turnover ratio	%	-14.21		-26.76	32.26	-41.19	-19.11
Labour productivity	000 €/FTE	15.25	48.31	4.80	288.79	13.78	10.26
Capital productivity	%	10.52	8.18	0.90	41.96	37.94	3.16
Financial Position	%	91.16	93.53	96.46	98.19	89.34	63.10
Future expectations of the industry	%	-0.03	0.00	0.00	-0.19	-0.07	0.00

Year 2008 part 4 of 4

Variable	unit	total	seg. 8.3	seg. 9.1	seg. 9.3	seg. 9.4	seg. 10.4
Turnover	000 EURO	462605.45	334.50	316.13	24510.96	908.74	1926.04
Subsidies	000 EURO	11432.17	8.04	0.00	2537.46	3.68	432.02
Other income	EURO	21747277.27	32073.19	0.00	134003.77	119740.00	1031878.08
Total income	EURO	495784897.29	374616.12	316134.92	27182423.02	1032163.14	3389940.76
Wages and salaries	EURO	97390329.52	146084.11	100829.50	7370792.70	459242.74	1729160.03
Imputed value of unpaid labour	EURO	67926118.34	43727.47	136025.35	7267196.22	164776.31	96383.48
Energy costs	EURO	13286494.91	14499.72	235.92	426993.03	52358.26	381544.02
Raw material costs: Feed costs	EURO	96841368.54	6785.78	2073.45	0.00	60528.03	419858.82
Raw material costs: Livestock costs	EURO	152882205.74	170646.35	13686.21	12193849.34	461149.78	23879.99
Repair and maintenance	EURO	13626316.62	11310.56	600.89	433689.10	64347.44	316372.77
Other operational costs	EURO	106907275.18	53079.45	112283.90	3795478.43	133732.08	2558340.38
Depreciation of capital	EURO	12658162.43	26798.37	16554.00	262472.04	109802.55	12836.93
Financial costs, net	EURO	-23711615.04	-12414.28	-1.88	-189400.85	-18671.82	-416297.72
Extraordinary costs, net	EURO	15356471.18	7639.13	0.00	44133.42	51.51	28920.42
Total value of assets	EURO	958508292.32	759935.57	0.00	9367311.13	1608252.03	10959668.13
Net Investments	EURO	42408590.82	74106.14	0.00	621795.70	277777.76	1089397.86
Debt	EURO	84758222.52	11409.89	0.00	524616.33	157132.20	1264952.56
Raw material volume: Feed	TONNE	154207.06					
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE						
Male employees	NUMBER	18344	19	44	4149	51	51
Female employees	NUMBER	7978	7	7	4519	14	25
Total employees	NUMBER	26322	26	51	8668	65	76
Male FTE	NUMBER	5124	14	5	747	34	38
Female FTE	NUMBER	1488	3	1	412	11	10
FTE	NUMBER	6612	17	6	1159	45	48
Number of enterprises <=5 employees	NUMBER	2028	6	1	414	3	4
Number of enterprises 6-10 employees	NUMBER	714	1		179	2	
Number of enterprises >10 employees	NUMBER	359	1	2	85	2	3
Number of enterprises	NUMBER	3101	8	3	678	7	7
Employment per firm	EURO	8.49	3.25	17.00	12.78	9.29	10.86
FTE per firm	EURO	2.13	2.13	2.00	1.71	6.43	6.86
Mean wage	EURO	25002.49	11165.39	39475.81	12629.84	13867.09	38032.16
Total production costs	EURO	548860108.85	446133.44	365735.22	31487998.82	1396134.64	5525539.49
Gross Added Value	000 EURO	100809.06	110.25	187.25	7794.95	256.36	-742.08
Operating Cash Flow	EURO	-53075211.56	-71517.32	-49600.30	-4305575.80	-363971.50	-2135598.73
EBIT	000 EURO	-65733.37	-98.32	-66.15	-4568.05	-473.77	-2148.44
Net Profit	EURO	-42021758.95	-85901.41	-66152.42	-4378646.99	-455102.23	-1732137.94
Return on investment	%	-6.86	-12.94		-48.77	-29.46	-19.60
Running cost to turnover ratio	%	118.65	133.37	115.69	128.46	153.63	286.89
EBIT to turnover ratio	%	-14.21	-29.39	-20.93	-18.64	-52.14	-111.55
Labour productivity	000 €/FTE	15.25	6.49	31.21	6.73	5.70	-15.46
Capital productivity	%	10.52	14.51		83.21	15.94	-6.77
Financial Position	%	91.16	98.50		94.40	90.23	88.46
Future expectations of the industry	%	-0.03	-0.06		-0.04	-0.10	-0.10

Year 2009 part 1 of 4

Variable	unit	total	seg. 2.1	seg. 2.2	seg. 2.3	seg. 3.1	seg. 3.2
Turnover	000 EURO	440027.77	4779.72	41726.05	2333.42	29617.18	16162.32
Subsidies	000 EURO	12736.56	0.00	715.12	0.00	344.97	475.41
Other income	EURO	14282415.11	47994.87	1474811.26	38183.95	696618.81	301707.97
Total income	EURO	467046746.02	4827717.37	43915985.42	2371607.70	30658769.44	16939439.95
Wages and salaries	EURO	87122122.97	1058082.08	10985482.52	549903.40	10816834.21	4021126.98
Imputed value of unpaid labour	EURO	22884904.16	6974.53	729592.55	0.00	582196.94	131513.96
Energy costs	EURO	22180055.83	188433.58	1191159.88	0.00	3667619.10	1956043.39
Raw material costs: Feed costs	EURO	110338870.08	1118464.84	13119747.46	596315.55	6387735.69	6026470.46
Raw material costs: Livestock costs	EURO	128525096.36	731824.28	4801602.73	422803.98	58867249.58	1390099.30
Repair and maintenance	EURO	15507638.10	178683.42	982243.65	27291.03	1062191.88	418611.13
Other operational costs	EURO	106752381.68	906343.51	8141080.57	174324.90	11342352.91	1976792.97
Depreciation of capital	EURO	39050997.91	165962.36	2058502.65	31205.60	3874729.86	1545951.32
Financial costs, net	EURO	-17794137.45	-37091.50	-217572.54	-7000.00	-2132308.81	-314951.03
Extraordinary costs, net	EURO	-8603167.66	13025.61	28396.41	0.00	-6990983.58	1035.04
Total value of assets	EURO	522281639.69	1551611.10	32690735.35	3064322.78	26716281.30	31460569.10
Net Investments	EURO	20429007.96	188414.43	849453.82	30300.00	460702.00	9787103.95
Debt	EURO	40136520.42	0.00	4390113.67	44635.00	556958.60	7845473.42
Raw material volume: Feed	TONNE	127460.64	1307.66	21353.20	1943.30	3499.55	6153.50
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE						
Male employees	NUMBER	20745	71	358	80	227	180
Female employees	NUMBER	8208	7	114	20	84	12
Total employees	NUMBER	28953	78	472	100	311	192
Male FTE	NUMBER	4897	52	319	67	219	151
Female FTE	NUMBER	1334	3	95	15	61	8
FTE	NUMBER	6231	55	414	82	280	159
Number of enterprises <=5 employees	NUMBER	1976	10	50	5		10
Number of enterprises 6-10 employees	NUMBER	767	2	12	1	4	3
Number of enterprises >10 employees	NUMBER	362	3	8	4	7	6
Number of enterprises	NUMBER	3105	15	70	10	11	19
Employment per firm	EURO	9.32	5.20	6.74	10.00	28.27	10.11
FTE per firm	EURO	2.01	3.67	5.91	8.20	25.45	8.37
Mean wage	EURO	17654.79	19364.67	28297.28	6706.14	40710.83	26117.24
Total production costs	EURO	493311069.18	4188806.24	39950909.36	1770638.86	92726180.31	15920658.19
Gross Added Value	000 EURO	71006.14	1703.97	14965.03		-51013.35	4696.01
Operating Cash Flow	EURO	-26264323.16	638911.13	3965076.06		-62067410.87	1018781.76
EBIT	000 EURO	-65315.32	472.95	1906.57		-65942.14	-527.17
Net Profit	EURO	-47521183.62	510040.27	2124145.95		-63809831.92	-212218.53
Return on investment	%	-12.51	30.48	5.83		-246.82	-1.68
Running cost to turnover ratio	%	112.11	87.64	95.75	75.88	313.08	98.50
EBIT to turnover ratio	%	-14.84	9.89	4.57		-222.65	-3.26
Labour productivity	000 €/FTE	11.40	30.98	36.15		-182.19	29.53
Capital productivity	%	13.60	109.82	45.78		-190.94	14.93
Financial Position	%	92.32		86.57	98.54	97.92	75.06
Future expectations of the industry	%	0.04	-0.01	0.04	0.00	0.13	-0.26

Year 2009 part 2 of 4

Variable	unit	total	seg. 3.4	seg. 4.1	seg. 4.2	seg. 4.3	seg. 5.2
Turnover	000 EURO	440027.77	138459.92	309.89	129.95	1822.73	3845.21
Subsidies	000 EURO	12736.56	2970.42	0.00	42.41	580.88	100.61
Other income	EURO	14282415.11	7361296.14	0.00	0.00	16194.05	77503.03
Total income	EURO	467046746.02	148791640.99	309890.56	172361.72	2419798.79	4023329.08
Wages and salaries	EURO	87122122.97	26632560.69	34468.30	816.32	151292.03	569647.62
Imputed value of unpaid labour	EURO	22884904.16	161296.14	1370.60	0.00	681.90	0.00
Energy costs	EURO	22180055.83	1751996.94	38767.24	3884.50	641167.55	0.00
Raw material costs: Feed costs	EURO	110338870.08	67189145.71	22264.77	4740.69	529326.34	1768877.56
Raw material costs: Livestock costs	EURO	128525096.36	33955127.76	79557.23	16725.59	199571.58	390998.74
Repair and maintenance	EURO	15507638.10	3207217.06	312644.74	2992.76	284238.91	39449.43
Other operational costs	EURO	106752381.68	35674180.18	42795.11	34906.12	257920.38	241222.15
Depreciation of capital	EURO	39050997.91	15335802.34	110885.07	265.69	49242.56	288051.42
Financial costs, net	EURO	-17794137.45	-6505338.96	-27629.68	-183.01	-31675.65	-171358.30
Extraordinary costs, net	EURO	-8603167.66	65666.62	-31571.48	-1125.78	-208642.82	0.00
Total value of assets	EURO	522281639.69	134414646.04	0.00	821296.13	18444831.23	7005119.85
Net Investments	EURO	20429007.96	6869788.27	0.00	0.00	15607.17	0.00
Debt	EURO	40136520.42	5089586.71	0.00	863889.00	708576.26	2002477.09
Raw material volume: Feed	TONNE	127460.64	77005.70	12.10	10.59	420.40	742.65
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE						
Male employees	NUMBER	20745	927	8	42	43	20
Female employees	NUMBER	8208	114	1	1	6	2
Total employees	NUMBER	28953	1041	9	43	49	22
Male FTE	NUMBER	4897	717	5	10	31	20
Female FTE	NUMBER	1334	81	1	1	5	2
FTE	NUMBER	6231	798	6	11	36	22
Number of enterprises <=5 employees	NUMBER	1976	14	5	39	11	2
Number of enterprises 6-10 employees	NUMBER	767	13			1	
Number of enterprises >10 employees	NUMBER	362	24			1	1
Number of enterprises	NUMBER	3105	51	5	39	13	3
Employment per firm	EURO	9.32	20.41	1.80	1.10	3.77	7.33
FTE per firm	EURO	2.01	15.65	1.20	0.28	2.77	7.33
Mean wage	EURO	17654.79	33576.26	5973.15	74.21	4221.50	25893.07
Total production costs	EURO	493311069.18	168571524.48	531867.99	64065.98	2064198.69	3010195.50
Gross Added Value	000 EURO	71006.14	4043.55	-186.14	66.70	-73.30	
Operating Cash Flow	EURO	-26264323.16	-19779883.49	-221977.43	108295.74	355600.10	
EBIT	000 EURO	-65315.32	-35115.69	-332.86	108.03	306.36	
Net Profit	EURO	-47521183.62	-28610346.87	-305232.82	108213.06	338033.19	
Return on investment	%	-12.51	-26.12		13.15	1.66	
Running cost to turnover ratio	%	112.11	121.75	171.63	49.30	113.25	78.28
EBIT to turnover ratio	%	-14.84	-25.36	-107.41	83.13	16.81	
Labour productivity	000 €/FTE	11.40	5.07	-31.02	6.06	-2.04	
Capital productivity	%	13.60	3.01		8.12	-0.40	
Financial Position	%	92.32	96.21		-5.19	96.16	71.41
Future expectations of the industry	%	0.04	0.06		0.00	0.00	0.04

Year 2009 part 3 of 4

Variable	unit	total	seg. 5.3	seg. 6.2	seg. 6.4	seg. 7.1	seg. 8.1
Turnover	000 EURO	440027.77	2800.26	46470.71	28852.39	97721.86	4969.66
Subsidies	000 EURO	12736.56	119.12	2211.11	0.02	269.55	6.27
Other income	EURO	14282415.11	1877698.02	761653.84	60001.66	0.00	3707.50
Total income	EURO	467046746.02	4797078.15	49443472.54	28912408.20	97991412.63	4979636.18
Wages and salaries	EURO	87122122.97	2351857.62	6864964.38	2874853.01	8320707.05	374329.20
Imputed value of unpaid labour	EURO	22884904.16	0.00	29354.82	0.00	14911816.44	378492.89
Energy costs	EURO	22180055.83	0.00	4390707.38	1131346.04	6003021.68	87214.87
Raw material costs: Feed costs	EURO	110338870.08	678978.39	7075651.94	3937749.18	0.00	0.00
Raw material costs: Livestock costs	EURO	128525096.36	52780.74	685526.06	8850517.10	10440319.29	2183758.37
Repair and maintenance	EURO	15507638.10	183759.72	1879354.34	700185.18	3538957.27	161932.75
Other operational costs	EURO	106752381.68	2512807.97	12449038.27	7308398.49	14967961.66	1578318.28
Depreciation of capital	EURO	39050997.91	713406.63	7315451.94	1209877.43	3794044.22	69516.16
Financial costs, net	EURO	-17794137.45	-406143.02	-4666746.50	-559057.25	-1545322.53	-31563.83
Extraordinary costs, net	EURO	-8603167.66	8177.79	1505021.89	3239.58	-3112031.80	13463.63
Total value of assets	EURO	522281639.69	13798610.16	156221881.70	18184150.99	5587420.11	20982499.78
Net Investments	EURO	20429007.96	473463.39	-105229.01	402506.00	276965.59	47562.54
Debt	EURO	40136520.42	5992535.97	285156.28	919237.20	0.00	7810462.88
Raw material volume: Feed	TONNE	127460.64	618.00	9143.04	4732.00		
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE						
Male employees	NUMBER	20745	42	402	107	13857	585
Female employees	NUMBER	8208	7	123	7	2825	183
Total employees	NUMBER	28953	49	525	114	16682	773
Male FTE	NUMBER	4897	40	358	66	1823	60
Female FTE	NUMBER	1334	2	115	1	453	19
FTE	NUMBER	6231	42	473	67	2276	83
Number of enterprises <=5 employees	NUMBER	1976	1	7		1347	36
Number of enterprises 6-10 employees	NUMBER	767	1	5		533	10
Number of enterprises >10 employees	NUMBER	362	1	7	4	186	16
Number of enterprises	NUMBER	3105	3	19	4	2066	62
Employment per firm	EURO	9.32	16.33	27.63	28.50	8.07	12.47
FTE per firm	EURO	2.01	14.00	24.89	16.75	1.10	1.34
Mean wage	EURO	17654.79	55996.61	14575.73	42908.25	10207.61	9070.15
Total production costs	EURO	493311069.18	5780184.44	33374597.19	24803049.00	58182783.39	4764046.36
Gross Added Value	000 EURO	71006.14		20752.09	6984.19	62771.60	962.14
Operating Cash Flow	EURO	-26264323.16		16068875.35	4109359.20	39808629.24	215589.82
EBIT	000 EURO	-65315.32		8753.42	2899.48	36014.59	146.07
Net Profit	EURO	-47521183.62		13420169.91	3458539.02	37559907.55	177637.49
Return on investment	%	-12.51		5.60	15.95	644.57	0.70
Running cost to turnover ratio	%	112.11	206.42	71.82	85.97	59.54	95.86
EBIT to turnover ratio	%	-14.84		18.84	10.05	36.85	2.94
Labour productivity	000 €/FTE	11.40		43.87	104.24	27.58	11.59
Capital productivity	%	13.60		13.28	38.41	1123.45	4.59
Financial Position	%	92.32	56.57	99.82	94.94		62.78
Future expectations of the industry	%	0.04	0.02	0.05	0.04	0.63	0.00

Year 2009 part 4 of 4

Variable	unit	total	seg. 8.3	seg. 9.1	seg. 9.3	seg. 9.4	seg. 10.4
Turnover	000 EURO	440027.77	457.65	83.81	9202.9	763.86	3240.64
Subsidies	000 EURO	12736.56	2.47	0	3504.13	6.48	543.1
Other income	EURO	14282415.11	8144.36	0	2222.71	194801.6	1347574.73
Total income	EURO	467046746	468265.21	83808.28	12709255.16	965139.22	5131305.18
Wages and salaries	EURO	87122122.97	165770.78	9341.65	6152501.71	446253.18	2481431.59
Imputed value of unpaid labour	EURO	22884904.16	26782.51	30751.87	5800944.21	87420.11	5714.69
Energy costs	EURO	22180055.83	66305.02	1830.58	142191.83	73033.86	452449.18
Raw material costs: Feed costs	EURO	110338870.1	0	0	0	121051.65	675018.65
Raw material costs: Livestock costs	EURO	128525096.4	10537.19	31014.86	4913874.68	5736.05	18827.99
Repair and maintenance	EURO	15507638.1	4778.3	4352.63	1883102.21	31099.16	283484.59
Other operational costs	EURO	106752381.7	128542.43	21851.71	5237705.21	132406.31	2085739.11
Depreciation of capital	EURO	39050997.91	84367.69	543.06	267392.8	7345.11	1572719.49
Financial costs, net	EURO	-17794137.45	-8687.26	-624.7	-5038.59	-44187.98	-410807.91
Extraordinary costs, net	EURO	-8603167.66	-119.61	-7.8	-1808.86	0	46145.33
Total value of assets	EURO	522281639.7	593300.85	0	10423048.74	2597121.28	15127349.15
Net Investments	EURO	20429007.96	-19827.75	0	537050.3	501479.1	93804
Debt	EURO	40136520.42	1202.02	0	824985	102003.97	1877496
Raw material volume: Feed	TONNE	127460.64				80.55	390.45
Raw material volume: Livestock	TONNE						
Total sales volume	TONNE						
Male employees	NUMBER	20745	19	24	3506	53	53
Female employees	NUMBER	8208	3	1	4116	517	18
Total employees	NUMBER	28953	22	25	7622	570	71
Male FTE	NUMBER	4897	16	12	737	26	45
Female FTE	NUMBER	1334	2	1	409	14	10
FTE	NUMBER	6231	18	13	1146	40	55
Number of enterprises <=5 employees	NUMBER	1976	7	1	421	3	6
Number of enterprises 6-10 employees	NUMBER	767	1	1	175	2	1
Number of enterprises >10 employees	NUMBER	362		1	83	3	2
Number of enterprises	NUMBER	3105	8	3	679	8	9
Employment per firm	EURO	9.32	2.75	8.33	11.23	71.25	7.89
FTE per firm	EURO	2.01	2.25	4.33	1.69	5	6.11
Mean wage	EURO	17654.79	10697.41	3084.12	10430.58	13341.83	45220.84
Total production costs	EURO	493311069.2	402716.23	99143.3	24130319.85	897000.32	6002665.8
Gross Added Value	000 EURO	71006.14	255.64	24.76	-2971.75	595.33	1072.69
Operating Cash Flow	EURO	-26264323.16	65548.98	-15335.02	-11421064.69	68138.9	-871360.62
EBIT	000 EURO	-65315.32	-18.82	-15.88	-11688.46	60.79	-2444.08
Net Profit	EURO	-47521183.62	-10131.45	-15253.38	-11683418.9	104981.77	-2033272.2
Return on investment	%	-12.51	-3.17		-112.14	2.34	-16.16
Running cost to turnover ratio	%	112.11	88	118.3	262.2	117.43	185.23
EBIT to turnover ratio	%	-14.84	-4.11	-18.95	-127.01	7.96	-75.42
Labour productivity	000 €/FTE	11.4	14.2	1.9	-2.59	14.88	19.5
Capital productivity	%	13.6	43.09		-28.51	22.92	7.09
Financial Position	%	92.32	99.8		92.08	96.07	87.59
Future expectations of the industry	%	0.04	0.18		-0.03	-0.19	0.1

Year 2008 part 1 of 2 (…continue specie list)

Species	Total Turnover Value (Euro)	Seg. 2.1 Value	Seg. 2.2 Value	Seg. 2.3 Value	Seg. 3.1 Value	Seg. 3.2 Value	Seg. 3.3 Value	Seg. 3.4 Value	Seg. 4.3 Value	Seg. 5.2 Value	Seg. 5.3 Value
Adriatic sturgeon	4640000										4640000
Atlantic bluefin tuna	43008535.26										
Atlantic salmon	209482.76		209482.76								
Banded carpet shell	975										
Black seabream	0										
Blackspot(=red) seabream	2176968.2		1497495				679473.2				
Coho(=Silver)salmon	0										
Common carp	91566.18								91566.18		
Common edible cockle	3423463.64										
Common octopus	171478.75										
Common periwinkle	0										
Common sole	0										
Cyprinids nei	0										
Danube sturgeon(=Osetr)	0										
Donax clams	0										
European eel	4304529.67					6272.11	76800			1012139.99	3200000
European flat oyster	5101058.53										
European seabass	67524399.82				6922130.09	3888197.95	13755450	42672007.73			
Flathead grey mullet	44000								44000		
Gastropods nei	32210										
Gilthead seabream	99013946.21				8165099.68	8706605.89	9068957	71817745.48			
Golden carpet shell	8043.35										
Goldfish	8000								8000		
Great Atlantic scallop	0										
Greater amberjack	14304										
Grooved carpet shell	2382109.4						6875	12900			

Year 2008 part 1 of 2

Species	Total Turnover Value (Euro)	Seg. 2.1 Value	Seg. 2.2 Value	Seg. 2.3 Value	Seg. 3.1 Value	Seg. 3.2 Value	Seg. 3.3 Value	Seg. 3.4 Value	Seg. 4.3 Value	Seg. 5.2 Value	Seg. 5.3 Value
Huchen	0										
Japanese carpet shell	9389192.6						557600				
Kuruma prawn	1073283						23000				
Largemouth black bass	0										
Meagre	5146321.73				73082.73	95029	515000	4463210			
Mediterranean mussel	90163663.66										
Pacific cupped oyster	1781182.86					22814		58500			
Palaemonid shrimps nei	182341.11					3940	176800				
Pollack	23959						23959				
Pullet carpet shell	2455330.4						120400				
Queen scallop	125										
Rainbow trout	58340792.16	2240925.72	21389919.52	33768890.8				41056.12			900000
Razor clams nei	2030										
Roaches nei	0										
Sea belt	9600										
Sea trout	144508	5508	20000	119000							
Seaweeds nei	675000										
Senegalese sole	879429.65					87789.3					
Siberian sturgeon	572730										572730
Signal crayfish	5400										
Spinous spider crab	0										
Starry sturgeon	0										
Striped bass, hybrid	0										
Tench	530838.52								530838.52		
Three-spined stickleback	0										
Turbot	58630615.92						159103.53	139500			
Valencia toothcarp	0										
Variegated scallop	3000										
Wakame	1260										
Warty venus	12000										
White seabream	410					210					
White-clawed crayfish	0										
Wreckfish	0										
Mugilidae	487025.16					11037.46	455700				

Year 2008 part 2 of 2 (…continue species list)

Species	Total Turnover Value (Euro)	Seg. 6.2 Value	Seg. 6.3 Value	Seg. 6.4 Value	Seg. 7.1 Value	Seg. 8.1 Value	Seg. 8.3 Value	Seg. 9.1 Value	Seg. 9.3 Value	Seg. 9.4 Value	Seg. 10.4 Value
Adriatic sturgeon	4640000										
Atlantic bluefin tuna	43008535.26			43008535.26							
Atlantic salmon	209482.76										
Banded carpet shell	975								975		
Black seabream	0										
Blackspot(=red) seabream	2176968.2										
Coho(=Silver)salmon	0										
Common carp	91566.18										
Common edible cockle	3423463.64				64577.98	21096.63	1215		3336574.03		
Common octopus	171478.75							27478.75		79040.75	64959.25
Common periwinkle	0										
Common sole	0										
Cyprinids nei	0										
Danube sturgeon(=Osetr)	0										
Donax clams	0										
European eel	4304529.67	9317.57									
European flat oyster	5101058.53				539820.29	4521131.36			360	39746.88	
European seabass	67524399.82	2639.05	15995	264980						3000	
Flathead grey mullet	44000										
Gastropods nei	32210				32210						
Gilthead seabream	99013946.21	3868.66	7187.5	1240282						4200	
Golden carpet shell	8043.35				40.7	12.95			7989.7		
Goldfish	8000										
Great Atlantic scallop	0										
Greater amberjack	14304		14304								
Grooved carpet shell	2382109.4	273.85			89576.46	16241.51	1620	12000	2222372.98	20249.6	

Year 2008 part 2 of 2

Species	Total Turnover Value (Euro)	Seg. 6.2 Value	Seg. 6.3 Value	Seg. 6.4 Value	Seg. 7.1 Value	Seg. 8.1 Value	Seg. 8.3 Value	Seg. 9.1 Value	Seg. 9.3 Value	Seg. 9.4 Value	Seg. 10.4 Value
Huchen	0										
Japanese carpet shell	9389192.6				122047.56	37460.86	500	39171.95	8281985.12	350427.11	
Kuruma prawn	1073283									6000	1044283
Largemouth black bass	0										
Meagre	5146321.73										
Mediterranean mussel	90163663.66				88837834.79	525875.97	17064	70258.74	52418.16		
Pacific cupped oyster	1781182.86	464.73			327787	981916.48	347383.69		4566.96	37750	
Palaemonid shrimps nei	182341.11	1601.11									
Pollack	23959										
Pullet carpet shell	2455330.4				31345.46	7969.01		138478.64	2044071.49	113065.8	
Queen scallop	125								125		
Rainbow trout	58340792.16										
Razor clams nei	2030				840	1190					
Roaches nei	0										
Sea belt	9600										9600
Sea trout	144508										
Seaweeds nei	675000										675000
Senegalese sole	879429.65	16031.34	775609.01								
Siberian sturgeon	572730										
Signal crayfish	5400										5400
Spinous spider crab	0										
Starry sturgeon	0										
Striped bass, hybrid	0										
Tench	530838.52										
Three-spined stickleback	0										
Turbot	58630615.92	24657206.49	32208065.9	1466740							
Valencia toothcarp	0										
Variegated scallop	3000					3000					
Wakame	1260										1260
Warty venus	12000				12000						
White seabream	410	200									
White-clawed crayfish	0										
Wreckfish	0										
Mugilidae	487025.16	20287.7									

Year 2009 part 1 of 2 (…continue)

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.1 Value	Seg. 2.2 Value	Seg. 2.3 Value	Seg. 3.1 Value	Seg. 3.2 Value	Seg. 4.1 Value	Seg. 4.2 Value	Seg. 4.3 Value	Seg. 4.4 Value	Seg. 5.2 Value
Adriatic sturgeon	1241263.47											
Atlantic bluefin tuna	28652861.47											
Atlantic salmon	3242.6											
Blackspot(=red) seabream	2018226.28			1413341.9								
Caramote prawn	0											
Coho(=Silver)salmon	0											
Common carp	43036.67							1890	11146.67	30000		
Common edible cockle	1152701.33											
Common octopus	60214.88											
Common periwinkle	374.43											
Common prawn	2200											
Common sole	21450											
Cyprinids nei	0											
Danube sturgeon(=Osetr)	0											
European eel	3932086.08						80687.16					3845212.63
European flat oyster	4175843.43											
European seabass	75791540.69					10468144.96	7780810.49					
Flathead grey mullet	58386							58386				
Gastropods nei	22208											
Gilthead seabream	99861625.33					16165108.52	4747749.03					
Goldfish	1000									1000		
Greater amberjack	32274											
Grooved carpet shell	2233117.58					8340						
Huchen	0											
Japanese carpet shell	6498015.31					691600						
Kuruma prawn	1238183.72						9975					
Largemouth black bass	85.51								85.51			
Meagre	4770130.63					106345.22	202355.58					
Mediterranean mussel	95821158.89											

Year 2009 part 1 of 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 2.1 Value	Seg. 2.2 Value	Seg. 2.3 Value	Seg. 3.1 Value	Seg. 3.2 Value	Seg. 4.1 Value	Seg. 4.2 Value	Seg. 4.3 Value	Seg. 4.4 Value	Seg. 5.2 Value
Pacific cupped oyster	2603395.32						8960					
Palaemonid shrimps nei	248980.02						231410					
Pollack	735.2											
Pullet carpet shell	2516889.74					258000						
Queen scallop	2238											
Rainbow trout	49293435.72		3429741.49	42623118.71	2344535.32							
Razor clams nei	40759.5											
Sea belt	2240											
Sea trout	78018.02		4010.24	74007.78								
Seaweeds nei	675000											
Senegalese sole	1536540.48					9086.42	96900.33					
Siberian sturgeon	517640											
Signal crayfish	5400											
Spanish toothcarp	0											
Spotted seabass	50.42						50.42					
Starry sturgeon	0											
Striped bass, hybrid	10993.46						10993.46					
Tench	481698.38							126678.33	89542.07	265477.98		
Three-spined stickleback	0											
Tuberculate abalone	0											
Turbot	53832359.38											
Valencia toothcarp	0											
Variegated scallop	11676											
Warty venus	10002											
White seabream	475.7						330.7					
White-clawed crayfish	0											
Wreckfish	0											
Mugilidae	515435.2					15499.96	482160.69					

Year 2009 part 2 of 2 (…continue)

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 5.3 Value	Seg. 6.2 Value	Seg. 6.4 Value	Seg. 7.1 Value	Seg. 8.1 Value	Seg. 8.3 Value	Seg. 9.1 Value	Seg. 9.3 Value	Seg. 9.4 Value	Seg. 10.4 Value
Adriatic sturgeon	1241263.47		1241263.47									
Atlantic bluefin tuna	28652861.47				28652861.47							
Atlantic salmon	3242.6											
Blackspot(=red) seabream	2018226.28											
Caramote prawn	0											
Coho(=Silver)salmon	0											
Common carp	43036.67											
Common edible cockle	1152701.33					35887.94	8553.28	2340		1105920.11		
Common octopus	60214.88											60214.88
Common periwinkle	374.43					11.88	2.31			360.24		
Common prawn	2200			2200								
Common sole	21450			21450								
Cyprinids nei	0											
Danube sturgeon(=Osetr)	0											
European eel	3932086.08			6186.29								
European flat oyster	4175843.43					727114.58	3343852.73			159	39717.12	
European seabass	75791540.69			2835.37	24822						2250	
Flathead grey mullet	58386											
Gastropods nei	22208			320		21888						
Gilthead seabream	99861625.33			5474.96							3500	
Goldfish	1000											
Greater amberjack	32274											
Grooved carpet shell	2233117.58				19500	93605.16	8679.92	3013	2737.5	2063865.71	33376.29	
Huchen	0											
Japanese carpet shell	6498015.31					145527.8	20482.85	1480	21079.49	5484721.29	133123.88	
Kuruma prawn	1238183.72											1203208.72
Largemouth black bass	85.51											
Meagre	4770130.63											
Mediterranean mussel	95821158.89					94962418.28	690344.09	14386.5		3937.6		

Year 2009 part 2 of 2

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 5.3 Value	Seg. 6.2 Value	Seg. 6.4 Value	Seg. 7.1 Value	Seg. 8.1 Value	Seg. 8.3 Value	Seg. 9.1 Value	Seg. 9.3 Value	Seg. 9.4 Value	Seg. 10.4 Value
Pacific cupped oyster	2603395.32					214392.01	1845849.89	433635		1950	21381	
Palaemonid shrimps nei	248980.02			3370.02				2200				12000
Pollack	735.2											
Pullet carpet shell	2516889.74				2485	88761.86	13700.57	600	141364.41	1701927.45	310050.45	
Queen scallop	2238									2238		
Rainbow trout	49293435.72		107935.95		35340							
Razor clams nei	40759.5					1188	450			39121.5		
Sea belt	2240											2240
Sea trout	78018.02											
Seaweeds nei	675000											675000
Senegalese sole	1536540.48			891866.95							4000	
Siberian sturgeon	517640		517640									
Signal crayfish	5400											5400
Spanish toothcarp	0											
Spotted seabass	50.42											
Starry sturgeon	0											
Striped bass, hybrid	10993.46											
Tench	481698.38											
Three-spined stickleback	0											
Tuberculate abalone	0											
Turbot	53832359.38			51448990.27	139364							
Valencia toothcarp	0											
Variegated scallop	11676											
Warty venus	10002					10002						
White seabream	475.7			145								
White-clawed crayfish	0											
Wreckfish	0											
Mugilidae	515435.2			17774.55								

Sweden

Year 2008

Variable	unit	total	Seg. 5.2	Seg. 5.4
Turnover	000 EURO	34457.00	4856.34	22375.67
Subsidies	000 EURO	2548.82	0.00	38.24
Other income	EURO	2917335.48	110452.67	72929.99
Total income	EURO	39923151	4745887	22486839
Wages and salaries	EURO	6191668.32	813465.02	3432288.89
Imputed value of unpaid labour	EURO	279060.23	94689.05	41603.50
Energy costs	EURO	1567871.43	456229.06	332828.01
Raw material costs: Feed costs	EURO	14352401.04	1398815.51	10879315.69
Raw material costs: Livestock costs	EURO	4084828.52	757512.40	2204985.59
Repair and maintenance	EURO	1365119.07	137729.53	936078.79
Other operational costs	EURO	5108216.60	632695.01	2933046.87
Depreciation of capital	EURO	1798359.94	273426.83	932017.15
Financial costs, net	EURO	687911.19	145016.92	268817.95
Extraordinary costs, net	EURO	66982.48	17216.19	20801.75
Total value of assets	EURO	46463377.96	5128116.25	26638508.46
Net Investments	EURO	4124964.24	198604.97	1104029.98
Debt	EURO	20301067.86	4110204.92	9102995.96
Raw material volume: Feed	TONNE	14153	903	9833
Raw material volume: Livestock	TONNE	862	51	561
Total sales volume	TONNE	8887	531	5784
Male employees	NUMBER	321	77	158
Female employees	NUMBER	22	0	0
Total employees	NUMBER	379	77	158
Male FTE	NUMBER	199		
Female FTE	NUMBER	24		
FTE	NUMBER	222.23	45	96
Number of enterprises <=5 employees	NUMBER	142	42	61
Number of enterprises 6-10 employees	NUMBER	9	0	3
Number of enterprises >10 employees	NUMBER	4	0	1
Number of enterprises	NUMBER	155	42	65
Employment per firm	EURO	2.45	1.83	2.43
FTE per firm	EURO	1.43	1.07	1.48
Mean wage	EURO	29117.26	20181.20	36186.38
Total production costs	EURO	32949165.21	4291135.58	20760147.34
Gross Added Value	000 EURO	10895.90	1362.91	5162.34
Operating Cash Flow	EURO	6973985.79	454751.42	1726691.66
EBIT	000 EURO	5175.63	181.32	794.67
Net Profit	EURO	4487714.66	36307.67	525856.56
Return on investment	%	11.14	3.54	2.98
Running cost to turnover ratio	%	95.62	88.36	92.78
EBIT to turnover ratio	%	15.02	3.73	3.55
Labour productivity	000 €/FTE	49.03	30.29	53.77
Capital productivity	%	23.45	26.58	19.38
Financial Position	%	56.31	19.85	65.83
Future expectations of the industry	%	-0.05	0.01	-0.01

Year 2009

Variable	unit	total	Seg. 1.2	Seg. 5.3	Seg. 5.4	Seg. 10.4
Turnover	000 EURO	29383.39	1894.98	8275.16	18095.42	1117.83
Subsidies	000 EURO	3210.24	0.00	236.46	285.03	2688.75
Other income	EURO	1609987	272557	-47529	1305704	79255
Total income	EURO	34203608	2167541	8464087	19686149	3885831
Wages and salaries	EURO	4031758	341537	1293386	2005177	391658
Imputed value of unpaid labour	EURO	208733	33875	150553	24305	0
Energy costs	EURO	1146370	165392	725391	194441	61145
Raw material costs: Feed costs	EURO	9248949	669068	2224076	6355804	0
Raw material costs: Livestock costs	EURO	2794357	301760	1204423	1288174	0
Repair and maintenance	EURO	876608	63658	218986	546867	47098
Other operational costs	EURO	3315006	269968	1005967	1713515	325556
Depreciation of capital	EURO	1814928	56353	599058	606502	553016
Financial costs, net	EURO	824180	249999	674806	578904	-679530
Extraordinary costs, net	EURO	49208	6377	27373	12153	3305
Total value of assets	EURO	34899413	1211283	8791699	20458315	4438116
Net Investments	EURO	5008705	942	3437978	1503112	66673
Debt	EURO	18743761	560645	5293610	10025240	2864266
Raw material volume: Feed	TONNE	9121	660	2193	6268	0
Raw material volume: Livestock	TONNE	590	64	254	272	0
Total sales volume	TONNE	10363	261	1369	6604	2128
Male employees	NUMBER	367				
Female employees	NUMBER	57				
Total employees	NUMBER	424	68	96	175	85
Male FTE	NUMBER	197.58				
Female FTE	NUMBER	23.92				
FTE	NUMBER	221.50	32.00	55.00	113.00	21.50
Number of enterprises <=5 employees	NUMBER	182	25	54	58	45
Number of enterprises 6-10 employees	NUMBER	7	2	0	2	3
Number of enterprises >10 employees	NUMBER	3	0	0	3	0
Number of enterprises	NUMBER	192	27	54	63	48
Employment per firm	EURO	2.21	2.52	1.78	2.78	1.77
FTE per firm	EURO	1.15	1.19	1.02	1.79	0.45
Mean wage	EURO	19144.43	11731.63	26253.44	17960.02	18216.65
Total production costs	EURO	21621781	1845258	6822782	12128283	825457
Gross Added Value	000 EURO	13612.08	697.70	2848.79	9302.32	763.28
Operating Cash Flow	EURO	12581827	322283	1641305	7557866	3060374
EBIT	000 EURO	10766.90	265.93	1042.25	6951.36	2507.36
Net Profit	EURO	9942719.00	15931.00	367441.00	6372460.00	3186888.00
Return on investment	%	30.85	21.95	11.85	33.98	56.50
Running cost to turnover ratio	%	73.59	97.38	82.45	67.02	73.84
EBIT to turnover ratio	%	36.64	14.03	12.59	38.42	224.31
Labour productivity	000 €/FTE	61.45	21.80	51.80	82.32	35.50
Capital productivity	%	39.00	57.60	32.40	45.47	17.20
Financial Position	%	46.29	53.71	39.79	51.00	35.46
Future expectations of the industry	%	-0.09	0.05	-0.32	-0.04	0.11

Year 2008

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 5.2 value	Seg. 5.2 weight	Seg. 5.4 value	Seg. 5.4 weight
Other freshwater fish	27232007	6315	4856340	531	22375667	5784

Year 2009

Species	Total Turnover Value (Euro)	Total Weight of Sales (Tonnes)	Seg. 1.2 value	Seg. 1.2 weight	Seg. 5.2 value	Seg. 5.2 weight	Seg. 5.4 value	Seg. 5.4 weight	Seg. 7.1 value	Seg. 7.1 weight
Mussels, Oysters and Other shel	1117825	2128							1117825	2128
Other freshwater fish	26370572	7973			8275154	1369	18095418	6604		
Salmon & Trout	1894984	261	1894984	261						

United Kingdom

Variable	unit	2008	2009
Turnover	000 EURO	647000	439000
Subsidies	000 EURO	0	0
Other income	EURO	0	0
Total income	EURO	647000000	439000000
Wages and salaries	EURO	68000000	58000000
Imputed value of unpaid labour	EURO		
Energy costs	EURO		
Raw material costs: Feed costs	EURO		
Raw material costs: Livestock costs	EURO		
Repair and maintenance	EURO		
Other operational costs	EURO	451000000	286000000
Depreciation of capital	EURO		
Financial costs, net	EURO		
Extraordinary costs, net	EURO		
Total value of assets	EURO	287000000	181000000
Net Investments	EURO		
Debt	EURO		
Raw material volume: Feed	TONNE		
Raw material volume: Livestock	TONNE		
Total sales volume	TONNE		
Male employees	NUMBER	6000	6000
Female employees	NUMBER	0	0
Total employees	NUMBER	6000	6000
Male FTE	NUMBER	6000	6000
Female FTE	NUMBER	0	0
FTE	NUMBER	6000	6000
Number of enterprises <=5 employees	NUMBER	431	322
Number of enterprises 6-10 employees	NUMBER	55	70
Number of enterprises >10 employees	NUMBER	45	50
Number of enterprises	NUMBER	531	442
Employment per firm	EURO	11.3	13.57
FTE per firm	EURO	11.3	13.57
Mean wage	EURO	11333.33	9666.67
Total production costs	EURO	519000000	344000000
Gross Added Value	000 EURO		
Operating Cash Flow	EURO		
EBIT	000 EURO		
Net Profit	EURO		
Return on investment	%		
Running cost to turnover ratio	%	80.22	78.36
EBIT to turnover ratio	%		
Labour productivity	000 €/FTE		
Capital productivity	%		
Financial Position	%		
Future expectations of the industry	%		

12. EWG-11-14 LIST OF PARTICIPANTS

Name	Address	Telephone no.	Email
STECF members			
Motova, Arina	European Regional Policy Institute, S. Konarskio str. 49, Vilnius, LT-03123. Lithuania	+37061219519	arina.motova@erpi.lt

Name	Address	Telephone no.	Email
Invited experts			
Avdelas, Lamprakis	Leoforos Athinon 58 10441 Athens. Greece	+302105275205 +306934781048	lavdelas@mou.gr lamprakisa@gmail.com
Avdic-Mravlje, Edo	Fisheries Research Institute Sp. Gameljne 61a Ljubljana 1211. Slovenia		edo.avdic@zzrs.si
Borges Marques, Ana Cristina	DGPA Avenida Brasilia 1499-030 Lisboa Portugal	+351 213 035771	cborges@dgpa.min-agricultura.pt
Cozzolino, Maria	IREPA Via San Leonardo Trav Migliaro, 84131 Salerno. Italy	+39089338978 FAX: +39089330835	Cozzolino@irepa.org mediterraneii@hotmail.com
Ebeling, Michael	vTI-Federal Research Institute for Rural Areas Forestry and Fisheries Palmaille 9 Hamburg 22767. Germany	+49 (0)40 38905-186	michael.ebeling@vti.bund.de
Guillen, Jordi (chair)	IFREMER, UMR AMURE, Unité d'Economie maritime, BP 70, F-29280 Plouzané Cedex. France.		jordi.guillen.garcia@ifremer.fr
Kazlauskas, Edvardas	State enterprise Agriinformation and Rural Business Center. V. Kudirkos g. 18 LT-03105 Vilnius. Lithuania	+37037397087	edvardas.kazlauskas@vic.lt
Lees, Janek	Estonian Marine Institute Màealuse 14 12618 Tallinn. Estonia	+37256610999	janek.lees@ut.ee
Moura, Carlos	DGPA Avenida Brasilia 1499-030 Lisboa. Portugal	+351 213 035 811	cmoura@dgpa.min-agricultura.pt
Nilsson, Pia	Swedish Board of Agriculture Jonkoping. Sweden	+46730483727	pia.nilsson@jordbruksverket.se pia.nilsson@ihh.hj.se

Name	Address	Telephone no.	Email
Invited experts			
Pienkowska, Barbara	Morski Instytut Rybacki – Panstwowy Instytut Badawczy National Marine Fisheries Research Institute. Ul. Kollataja 1 81-332 Gdynia. Poland	+48587356115 +48604102639	basior@mir.gdynia.pl
Pokki, Heidi	Finnish Game and Fisheries Research Institute Viikinkaari 4 Helsinki FI-0079. Finland		Heidi.Pokki@rktl.fi
Reese, Allan	Cefas The Nothe Weymouth DT4 8UB. UK	+44 1305 206614	allan.reese@cefas.co.uk
Sainz de la Torre, Ana	Tragsatec Rua dos Caminos da vida, s/n Santiago de Compostela – Spain	+34 981569627	asainzde@tragsa.es
Stroie, Constantin	National Agency for Fishery and Aquaculture of Romania	+4021 634 44 29	constantin.stroie@anpa.ro
Vassallo, Darcelle	Agriculture and Fisheries Regulation Department, Ministry for Resources and Rural Affairs. Malta	+35622293321	darcelle.vassallo@gov.mt

Experts by correspondence			
Dennis, John	BIM Clogheen. Clonakilty. Co. Cork. Ireland		dennis@bim.ie
Nielsen, Rasmus	Institute of Food and Resource Economics University of Copenhagen Rolighedsvej 25 1958 Frederiksberg. Denmark	+45 35 33 22 93	rn@foi.dk
Oostenbrugge, Hans van	LEI Wageningen UR P.O. Box 29703 2502 The Hague. The Netherlands		Hans.vanoostenbrugge@wur.nl
Paulrud, Anton	Swedish Agency for Marine and Water Management Ekelundsgatan 1 404 39 – Göteborg Sweden		Anton.paulrud@havochvatten.se

JRC Experts			
Contini, Franca	Joint Research Centre (IPSC) Maritime Affairs Unit Via E. Fermi, 2749 21027 Ispra (Varese) Italy	+ 39 0332 78 5646	contini.franca@jrc.ec.europa.eu
Fiore, Gianluca	Joint Research Centre (IPSC) Maritime Affairs Unit Via E. Fermi, 2749 21027 Ispra (Varese) Italy	+ 39 0332 78 6710	gianluca.fiore@jrc.ec.europa.eu
Hofherr, Johann	Joint Research Centre (IPSC) Maritime Affairs Unit Via E. Fermi, 2749 21027 Ispra (Varese) Italy	+ 39 0332 78 9053	johann.hofherr@jrc.ec.europa.eu
Natale, Fabrizio	Joint Research Centre (IPSC) Maritime Affairs Unit Via E. Fermi, 2749 21027 Ispra (Varese) Italy	+ 39 0332 78 9181	fabrizio.natale@jrc.ec.europa.eu
Virtanen, Jarno	Joint Research Centre (IPSC) Maritime Affairs Unit Via E. Fermi, 2749 21027 Ispra (Varese) Italy	+39 0332 78 9614	jarno.virtanen@jrc.ec.europa.eu
Zanzi, Antonella	Joint Research Centre (IPSC) Maritime Affairs Unit Via E. Fermi, 2749 21027 Ispra (Varese) Italy	+39 0332 78 9111	antonella.zanzi@jrc.ec.europa.eu

Name	Address	Telephone no.	Email
European Commission			
Calvo Santos, Angel Andres	DG Fisheries and maritime affairs	+32 229 93630	angel-andres.calvosantos@ec.europa.eu
Tritten, Christian	DG Fisheries and maritime affairs	+32 476 674 781	christian.tritten@ec.europa.eu
Vasilaki, Marousa	Joint Research Centre (IPSC), STECF secretariat	Tel.+390332789329 Fax+390332789658	marousa.vasilaki@ec.europa.eu

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EWG-11-14 members: Guillen, J., Contini, F., Avdelas, L., Avdic-Mravlje, E., Borges Marques, A.C., Cozzolino, M., Ebeling, M., Fiore, G., Hofherr, J., Kazlauskas, E., Lees, J., Motova, A., Moura, C., Natale, F., Nilsson, P., Pienkowska, B., Pokki, H., Reese, A., Sainz de la Torre, A., Stroie, C., Vassallo, D., Virtanen, J., Zanzi, A., Dennis, J., Nielsen, R., Oostenbrugge, H.V. & Paulrud, A.

STECF members: Casey, J., Abella, J. A., Andersen, J., Bailey, N., Bertignac, M., Cardinale, M., Curtis, H., Daskalov, G., Delaney, A., Döring, R., Garcia Rodriguez, M., Gascuel, D., Graham, N., Gustavsson, T., Jennings, S., Kenny, A., Kirkegaard, E., Kraak, S., Kuikka, S., Malvarosa, L., Martin, P., Motova, A., Murua, H., Nowakowski, P., Prellezo, R., Sala, A., Somarakis, S., Stransky, C., Theret, F., Ulrich, C., Vanhee, W. & Van Oostenbrugge, H.

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Abstract

This EWG-11-14 report, on the Economic Performance of the European Union (EU) Aquaculture sector, is the first report of this type produced for the sector. It provides a comprehensive overview of the latest information available on the structure, social, economic and competitive performance of the aquaculture sector at both national and EU level. The data used in this publication was collected under the Data Collection Framework (DCF). In 2009, the aquaculture sector production in the EU-22 (excluding the 5 landlocked Member States) accounted for 1.30 million tones, with an estimated turnover of 3.33 billion Euros. In the EU there are about 15,000 companies, whose main activity is the aquaculture production, producing a Gross Value Added of almost 270 million Euros. Profitability in 2009, based on the return on investment calculated from the EBIT was negative at -1.6 %, meaning that the sector has been suffering losses. The EU aquaculture sector gave direct employment to around 80,000 people in Europe, with an annual average wage of around 13,750 Euro. Women accounted for 25 % of these jobs. The large percentage of part-time work in the sector should be highlighted, as can be seen through comparison of the total employment numbers with employment expressed in Full Time Equivalents (FTE is 38 % of the total number of employees). The economic performance and the productivity differ enormously by segment. The cost structures of the different segments are also presented on the report. While the EU aquaculture sector has made several achievements over the last decades, the sector is at present suffering from a period of stagnation (low production growth). If some of the main obstacles are removed, however, the EU aquaculture sector can overcome the stagnation, especially through its strong capacities in innovation and technological development. The STECF reviewed the EWG-11-14 report by written procedure in March 2012.

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The Scientific, Technical and Economic Committee for Fisheries (STECF) has been established by the European Commission. The STECF is being consulted at regular intervals on matters pertaining to the conservation and management of living aquatic resources, including biological, economic, environmental, social and technical considerations.

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